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Penicillin in Str. agalactiae Infection: Trials Made in Great Britain in 1945 and 1946

The purpose of this article is to place on record preliminary trials on the use of penicillin for the sterilisation of *Str. agalactiae* infections of the bovine udder, by members of the Mastitis Conference of the Agricultural Research Council of Great Britain.

The following workers and laboratories took part:—

S. J. Edwards, D. L. Hughes and J. I. Taylor, Agricultural Research Council, Field Station, Compton.

A. D. McEwen and Margaret Cooper, Animal Diseases Research Association, Moredun, Edinburgh.

P. S. Watts and D. H. McLeod, The Hannah Dairy Institute, Ayr.

A. T. R. Mattick and F. K. Neave, National Institute for Research in Dairying, Shinfield, nr. Reading.

S. L. Hignett and W. R. Kelly, Wellcome Veterinary Field Station, Frant, nr. Tunbridge Wells.

A. W. Stableforth, J. C. Buxton, and J. E. Lancaster, Ministry of Agriculture and Fisheries, Veterinary Laboratory, Weybridge.

Experiments carried out at Compton in 1943 (Edwards and Brownlee, 1946) had shown that penicillin was likely to be effective in the treatment of *Str. agalactiae* infections. It was not, however, until 1945 that supplies sufficient for adequate field trials became available.

Pilot Trials

Pilot trials were undertaken at three centres, *viz.*, Moredun where two, four, six, eight and ten doses of 10,000 units or eight to ten doses of 20,000 units injected after successive milkings were tried; at Shinfield where two or more doses of 20,000 units at intervals of 24 hours were used; and at Weybridge where, after some preliminary experiments, one, two and four doses of 10,000 units after successive milkings were tried side by side in one large herd. The results are shown in Table I.

Table I

Pilot trials showing proportion and percentage of *Str. agalactiae* infected quarters sterilised by various systems of dosage. The denominator is the total quarters injected, the numerator is the number cured

Dose	Interval	Number of doses			
		1	2	4	8–10
10,000 units	Successive milkings	16/48 (33%)	34/54 (63%)	44/54 (82%)	21/37 (57%)
20,000 units	24 hours	—	22/30 (73%)	—	25/26 (96%)

In addition five out of seven quarters were cured by two injections of 10,000 units at an interval of 24 hours.

The methods of testing and criteria of sterilisation varied somewhat at the several centres but were sufficiently alike to justify the use of the results as a guide in arranging a larger trial. It will be seen that over 70 per cent. of infections were sterilised by two injections of 20,000 units with an interval of 24 hours and that whilst one, two and four injections of 10,000 units after successive milkings sterilised 33, 63 and 82 per cent. respectively and eight to ten injections of 20,000 at intervals of 24 hours 96 per cent. the results were much lower with eight to ten doses of 10,000 units, *viz.*, 57 per cent. The cows concerned had an average amount of clinical mastitis, and in most cases symptoms disappeared in one to a few days.

The results obtained at the Hannah centre are included in those reported by Watts, 1947.

It was at this stage considered that this clinical result coupled with a sterilisation rate of the order of 70 per cent. would be adequate for primary treatment and that more extended treatment should be reserved for resistant cases. It was decided, therefore, bearing in mind the costs of penicillin at this time (1945) and the veterinary expenses for a large number of injections, that a conjoint trial on larger numbers of animals should be made using two doses of 20,000 units with a 24 hour interval, four doses of 20,000 units with intervals of 24 hours, four doses of 10,000 units after successive milkings and a single dose of 100,000 units.

First Conjoint Trial

For this trial and the second conjoint trial (see later) the same methods of examination and criteria for pre- and post-treatment tests were adopted, at all centres. One tenth ml. of milk was plated on blood agar plates and read after 48 hours at 37° C., *Str. agalactiae* being identified by its colonial appearance, supplemented where necessary by group precipitin tests using acid extracts of 18 hour glucose broth cultures.

The criterion of infection was three positive tests shortly before treatment, two within the previous week. The criterion of cure was seven negative tests, three in the week after treatment and four further tests at weekly intervals. The milk of each cow was also examined before and after treatment for abnormality.

All penicillin injections were made in 50 ml. of distilled water and all quarters were treated, whether infected or not.

At each centre the infected cows in one or more herds were divided into four groups which were as nearly similar as possible, taking into account mastitis history and clinical condition of the udder, degree of infection, milk yield and age.

The results of the first conjoint trial are shown in Table II.

Table II

First Conjoint Trial: proportion and percentage of *Str. agalactiae* infected quarters and cows sterilised by various systems of dosage in units penicillin

Centre	Dosage per quarter			
	1 × 100,000	2 × 20,000 daily	4 × 10,000 b.i.d.	4 × 20,000 daily
Compton ...	9/19	20/24	17/21	19/21
Frant ...	1/4	4/9	4/14	0/6
Hannah ...	10/18	14/19	18/20	12/17
Moredun ...	6/6	6/6	7/7	6/7
Weybridge...	5/15	8/13	7/11	11/14
Totals (cows)	31/62 (50%)	52/71 (73%)	53/73 (73%)	48/65 (74%)
Quarters				
Compton ...	25/47	46/56	41/45	44/49
Frant ...	2/9	10/17	16/29	1/11
Hannah ...	29/40	32/39	37/39	30/36
Moredun ...	12/12	13/13	13/13	11/12
Weybridge...	13/32	32/29	18/24	35/42
Totals (quarters)	81/140 (58%)	123/154 (80%)	125/150 (83%)	121/150 (81%)
Average quarters infected	2·26	2·17	2·06	2·31

It will be seen that by the single dose of 100,000 units per quarter only 58 per cent. of infected quarters in 50 per cent. of the cows were sterilised, whilst the results with the other methods, *viz.*, two doses of 20,000 daily, four doses of 10,000 at successive milkings and four doses 20,000 daily were similar (80 to

83 per cent. for quarters and 73 to 74 per cent. for cows). At some centres one or other method was exposed to a more severe test as regards the numbers of quarters infected in the cows concerned, but it will be seen that, in total, the average number of infected quarters was nearly the same for each method. With all methods clinical symptoms were usually removed.

It was concluded from this trial (preliminary report *Vet. Rec.*, 1946) that one injection, even of 100,000, was insufficient but that the results showed no significant difference between the other three methods, injection of 20,000 units per quarter on two occasions after afternoon milking with an interval of one day being the method of choice for ordinary use in veterinary practice.

Another trial was then planned in which the use of two larger doses would be compared with the 2 × 20,000 unit method.

Second Conjoint Trial

Methods and criteria for this trial were as already described, except that at Compton the penicillin was injected in 10 ml. distilled water instead of 50 ml., in order to test whether the slight loss in milk yield and abnormality found in the foremilk in the first conjoint trial was due to the larger volume. Daily records from 35 cows indicated that reduction of the volume may be of advantage.

Table III

Second Conjoint Trial: proportion and percentage of *Str. agalactiae* infected quarters and cows sterilised by various systems of dosage in units penicillin

Centre	Dosage per quarter (interval 24 hours)		
	2 × 20,000	2 × 40,000	2 × 100,000
Cows			
Compton ...	23/29 80%	20/27 74%	—
Hannah ...	12/23 52%	11/21 52%	—
Shinfield ...	14/20 70%	—	12/15 80%
Weybridge ...	22/38 58%	—	26/38 68%
Frant ...	—	—	11/18 61%
Totals (cows) ...	71/110 65%	31/48 65%	49/71 69%
Quarters			
Compton ...	66/72 92%	58/68 85%	—
Hannah ...	38/51 75%	33/47 70%	—
Shinfield ...	29/37 78%	—	24/28 86%
Weybridge ...	63/87 72%	—	77/97 79%
Frant ...	—	—	17/26 65%
Totals (quarters)	196/247 79%	91/115 79%	118/151 78%
Average quarters infected	2·25	2·40	2·13

It will be seen from Table III that at the Hannah and Compton, a comparison was made of two doses of 20,000 units and two doses of 40,000 units and that the larger dose was not better. At Shinfield and Weybridge, the comparison was between two doses of 20,000 units and two of 100,000 units, and the results at each centre show an advantage in favour of the 100,000 unit dose, amounting to 10 per cent. in terms of cows and 7 to 8 per cent. as regards quarters. At Frant no control 20,000 units treatments were done. The numbers of infected quarters per cow were 2·25, 2·40 and 2·13 for the 20,000, 40,000 and 100,000 unit methods respectively. Addition of all the results shows, as regards cows, no advantage from increase to 40,000 units, but some advantage from increase to 100,000 units. The total quarter results show no difference with the three methods. This is, however, mainly due to the influence of the Frant results with 100,000 units to which as already stated there is no control and therefore no indication as to whether there were in the herds concerned factors conducive to poor results. Factors of this kind undoubtedly exist as shown by the marked difference which most workers have found from herd to herd.

DISCUSSION

At the time when these trials were begun, penicillin had just become available in amounts adequate for veterinary use and their primary purpose was to find the most practicable way of using penicillin in *Str. agalactiae* infections; bearing in mind, on the one hand, the need from a general practice view-point of obtaining a high proportion of clinical cures, and from the eradication view-point, a high sterilisation rate, and on the other hand, the necessity of keeping the doses of penicillin and number of injections, and therefore total costs of drug and veterinary attention, as low as possible. Trials with larger and longer continued dosage will be the subject of subsequent reports by certain of the workers concerned.

Comment has already been made on the results of each trial in which several methods were tried side by side in the same herd, and there are objections to considering the results together because it is well known that the same treatment may give very different results in different herds for reasons which we do not altogether understand but which include the lower cure rates in old-standing cases, a fact noted with all methods of treatment, variable chances of reinfection during the period of observation, persistent skin infection, associated often with sores and cracks, and a variety of other factors. Some general comment is, however, justifiable. It will be made in terms of quarters cured because, although for eradication purposes it is cows which matter, the quarter results are more numerous and provide the better basis for comparison of therapeutic efficiency. It is worthy of note, however, that the results in terms of quarters cured are about 10 per cent. higher than those for cows.

A single dose of 100,000 (58 per cent. of quarters cured) is better than one of 10,000 (33 per cent.) but both are inadequate. Two doses of 10,000 at successive milkings are better (63 per cent.) but provide too short a period of treatment. Two doses of 20,000 (73 to 80 per cent.) with an interval of 24 hours, provide a useful primary treatment and remove clinical symptoms in most cases. Increase of the dose to 40,000 units (79 per cent.) shows no advantage over 20,000 units. The total results (78 per cent., Table III) also show no advantage in increase to 100,000 units, but comparison of the results at the two centres at which it was compared side by side with the 20,000 unit dose show in each case a small but clear advantage, and it seems probable that if only two doses are used 100,000 units is better than a smaller dose—probably as a result of the better carry over as shown by penicillin estimations which were made in many cases. Four doses of 10,000 units (81 to 82 per cent.) at successive milking is no better than two larger doses daily and needs as much penicillin and more injections. The results with four doses at daily intervals were disappointing and surprising, and at the time led us to think that about 80 per cent. was the maximum percentage sterilisation which could be expected by any method of treatment, or at any rate by any single course. The results in the pilot trial with eight to ten doses at intervals of 24 hours conflict with this view, however, and subsequent work has shown that a sterilisation rate of over 90 per cent. can be obtained by prolonged treatment.

It will have been noted that results are based on direct tests on blood agar plates and not on enrichment tests, *e.g.*, incubation of samples overnight followed by plating. This was done because, although enrichment methods in general provide the best final criterion of absence of *Str. agalactiae*, they can be and often are positive even in carefully taken samples, although the milk is not infected, the positive results arising from a few *Str. agalactiae* from the outside of the udder, which may be resident there in sores, etc., or have recently got there from hands or other source. It was felt, therefore, that the direct plate method would provide the best basis of comparison of various methods. The three pre-treatment tests were made partly to exclude these extraneous infections and partly to ensure that only established infections were used. The seven post-treatment tests in five weeks were adopted because it was thought that nearly all recrudescences would appear within this period and that a longer period would be likely to increase the number of reinfections. It is probable that some occurred and are included as failures, whilst it is also likely that a few infections reported as sterilised would have broken down in a longer post-treatment period.

No details of the clinical state of the udders or milk or of the clinical effects of treatment, have been given. They show that one-third of the infected quarters were giving visibly abnormal secretion before treatment, and that in nearly 90 per cent. of these cases the secretion became normal, usually in one or two days after the beginning of treatment. Old-standing individual quarters often resisted treatment but abnormality of milk alone did not appear to influence the results.

Summary

1. Penicillin trials made in 1945 and 1946 on 1,363 *Str. agalactiae* infected quarters are reported.
2. Results were as follows :—

(*Concluded at foot of next page*)

The Control of Parasites in Relation to Preventive Veterinary Medicine

DISCUSSION BY THE CENTRAL VETERINARY SOCIETY*

The Acquisition of Resistance to Coccidiosis by Chickens During Treatment with Sulphonamides

By

C. HORTON-SMITH

The question of the control of parasites in relation to preventive medicine can be approached in two ways: (1) by the exclusion of infection or the eradication of the parasites before they set up disease and (2) by the control of parasites to such proportions that they do not produce a condition of disease.

The extent of the distribution of parasites, conditions to some extent our methods for dealing with them. The parasite requiring the interpolation of an intermediate host for its development narrows down its effective range to that of the intermediate host and presents a case for its eradication by destruction of the intermediate host, or of eradication from those primary hosts which pick up infection in the relatively limited areas populated by the intermediate hosts.

A parasite with direct development is passed out of its host into the neighbourhood of the same host, or, in the case of herd animals, into the neighbourhood of other hosts of the same species which will mean that a dense ground population of infective forms ultimately is built up. Coccidiosis provides an excellent example of the group of diseases caused by parasites of wide distribution in which it is preferable to aim at maintaining the resistance of the host group by permitting an ever-present low grade infection. In many cases these low grade infections can be realised by appropriate methods of hygiene and grazing but there seems to be no guarantee that the low-grade infections can always be maintained without danger.

It is my purpose to draw attention to two possible ways by which resistance to coccidiosis may be attained without endangering the health and survival of the host.

If small and large numbers of coccidia are administered to different chickens it is known that those receiving sufficiently small doses will show no symptoms and will remain susceptible to disease; those receiving large doses will show symptoms and they may either succumb or recover in which case they are resistant to disease. Between these two extremes are levels of infection in which chickens will show slight or no symptoms but will be resistant to further disease. It must be emphasised that resistance to disease does not mean an absolute resistance to parasitism although this will be of decreased magnitude. Resistance will be maintained by the constant ingestion of infective oöcysts and the intracellular penetration by sporozoites.

It is known that certain sulphonamides are highly effective in dealing with established coccidial infections, and that these drugs are active against a late stage of the life history, the second generation schizont. The second generation schizonts, stages which are present in the epithelial cells both on the fourth and fifth days after administration of sporulated oöcysts, are responsible for the condition of disease and deaths of the hosts. Provided that a sufficiently high blood-concentration of an effective sulphonamide is reached before the segmentation of the schizonts into merozoites, and is maintained, there will be neither symptoms of disease nor deaths of the hosts. Effective blood concentrations can be attained even in those cases where the drug is withheld until the fourth day after the initial infection. Chickens exposed to heavy infections while under treatment will survive and be resistant to fatal doses of coccidia after the lapse of ten days from the development of the schizonts; moreover, chickens are even resistant to experimental doses of coccidia of magnitudes far exceeding those that they are likely to pick up in the field and which are very severe tests of the strength of the resistance. The development of immunity during treatment has interesting possibilities. The chickens, or rabbits, will not develop disease during the period of their acquiring resistance and a way is thus opened up by which a practical method of permanent disease control can safely be applied. This work of English investigators paved the way for two lines of enquiry: one was based on the fact that in a natural epidemic some chicks will pick up lethal doses of coccidia before others and that consequently, the pathogenic stages of the life-history will be reached at different times in different chicks. Seeger & Tomhave (1946) evolved a method which took account of these differences in the life-history by feeding sulphaguanidine at intervals so that there exists in the chicken's blood an effective concentration of the drug to meet the pathogenic stages as they appear. These workers studied naturally occurring infections of caecal coccidiosis in pens containing 900 chickens. They found that natural infections of the individual chicks cover approximately two weeks. At any one time during the early stages of the epidemic there are present in the flock some chickens in the advanced stages of the disease which will not respond to any treatment, other birds passing through the first, second, third and fourth days of infection, and finally a number of highly susceptible birds. The condition of the naturally infected chicks corresponds to that of artificially infected birds during the first to the fifth day after inoculation. The first treatment is too late for the few chickens which show symptoms and mark the beginning of the epidemic, but those with the less advanced infections are benefited. A large group which had yet to pick up heavy infections would receive the drug but would remain susceptible. To cover all these possible grades of infection it was necessary to feed sulphaguanidine at different intervals during the usual course of the disease. Hitherto uninfected chicks could pick up infection between treatments but we now know that chicks could pick up infection during treatment with certain sulphonamides as well. This intermittent method of feeding sulphaguanidine showed most promise of several methods used on naturally occurring outbreaks and was successful in overcoming the problem of co-ordinating the treatment with the acquiring of immunity by infected birds. The interval between treatments permitted those chicks that were uninfected and susceptible during the first treatment to pick up infection between succeeding treatments.

The schedule of intermittent feeding of sulphaguanidine co-ordinated with the development of the natural outbreak gave the greatest protection from losses in birds passing through a natural infection with caecal coccidiosis. The schedule adopted by Seeger and Tomhave consisted of three one-day feedings of 1 per cent. sulphaguanidine in the food, beginning with the first signs of the disease and allowing four days between treatments. Treatment will cover eleven days in all.

Another, and in many ways a more promising approach as actual losses from coccidiosis need not occur, is that of Swales (1946) who published an account of experiments on the use of chemotherapeutical methods during the immunising exposure of chicks. If an epidemic of coccidiosis breaks out in a group of chicks on a large poultry plant it follows that they are susceptible to the disease as will be younger chicks which have been reared under identical methods of management. If these younger chicks are brought from the brooders and are placed on the contaminated floors on which the infected birds were run they will in all probability develop coccidiosis unless they are treated during this

* April, 1948, Meeting.

Pilot Trials			
One dose of	10,000 units	Successive milkings	Sterilised 33%
Two doses „	10,000 „	„ „ „	„ 63%
Four „	„ 10,000 „	„ „ „	„ 82%
Two „	„ 20,000 „	24-hour intervals	„ 73%
Eight to ten doses,	10,000 units	Successive milkings	57%
Eight to ten doses,	20,000 units	24-hour interval	96%
First Conjoint Trial			
One dose of	100,000 units		Sterilised 58%
Two doses „	20,000 „	24-hour interval	„ 80%
Four „	„ 20,000 „	„ „ „	„ 81%
„ „	„ 10,000 „	Successive milkings	„ 83%
Second Conjoint Trial			
Two doses of	20,000 units	24-hour interval	Sterilised 79%
„ „	40,000 „	„ „ „	„ 79%
„ „	100,000 „	„ „ „	„ 78%

3. In the two conjoint trials the results are based on three tests before treatment, and seven post-treatment tests covering a period of five weeks. Samples were examined by plating 0·1 ml. whole milk on plain blood agar plates and identification of *Str. agalactiae* by its colonial characters, supplemented by group precipitation tests.

In the pilot trials methods varied but were similar.

4. All penicillin injections were made in 50 ml. of distilled water, except at one centre in the second conjoint trial where the use of a 10 ml. volume was followed by results indicating that it might avoid the slight drop in milk yield otherwise sometimes encountered.

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period of exposure when resistance to coccidiosis will develop without any ill-effects. Swales, in considering the period of exposure necessary to establish immunity, says that the first six days of the exposure, if kept under control by a low level of medication, apparently brings about a degree of resistance which protects the chicks from the continued exposure in the contaminated pen. The drug Swales used was sulphamerazine at the rate of 1 gramme of the drug per pound of dry mash. Preliminary work along the same lines, but using sulphamezathine, indicates that treatment need not be started until at least the second day of exposure and that from three to five days' treatment may be sufficient to cover all grades of infection in the different chickens. The subsequent daily intake of oocysts after treatment has been completed will contribute to the maintenance of the resistance established during treatment.

If further work confirms the value of these methods and demonstrates the non-toxicity of such routine treatment and also that sulphonamide-fast strains of coccidia will not be produced, we shall be armed with a weapon against disease which, in its effect, appears to be both simple in its application and biologically sound in its mechanism.

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The Control of Parasites (Helminths)

By

ANN RUSSELL

(Animal Health Trust)

The new graduate leaving college with lectures and textbooks fresh in his mind, may well think that there is an answer to every parasitic problem. As time goes on, however, he will become increasingly aware that many outbreaks of parasitic disease do not conform to the typical textbook description or respond to the recommended treatment. Where helminth infestations are concerned he will turn to anthelmintic treatment as a means of controlling disease. This will often prove unsatisfactory, however, because the efficiency of most anthelmintics known at present leaves much to be desired and in many cases serious damage has already been done by migrating larvae or immature worms before they are susceptible to anthelmintic action.

Prospects of success are much greater by keeping the parasite from the host, than by trying to eliminate it, once it has established itself. Many parasites can be more easily controlled by attacking them during that part of their life cycle which is passed outside the host, and this is especially so in the case of the strongyloid nematodes causing parasitic gastro-enteritis in grazing animals, where the life cycle is direct and infestation is brought about by ingestion of infective larvae picked up from the pasture. Complications may be introduced in other cases by the necessity for an intermediate host, as with the tapeworm, *Dipylidium caninum* in the dog, which cannot be effectively controlled without eliminating also the flea in which part of its life cycle is spent. The development of a free-living generation, such as occurs with the *Strongyloides* spp. parasitising the small intestine of sheep, pigs, horses and other animals, may enable the parasite to multiply outside the host, while the infectivity of the parasite for wild animals or birds which may act as carriers, as do rooks and starlings for the gapeworm of domestic poultry, may enable a parasitic infection to survive for long periods even in the absence of the normal host.

In the case of the strongylid and trichostrongylid worms, causing strongylosis in equines and parasitic gastro-enteritis in ruminants, however, pasture management offers a very promising means of control, although the development of ley farming has been disappointing in this respect. It was hoped that the use of new pastures known to be free from parasitic infestation would be highly beneficial and lead to a marked reduction in parasitism. This hope, however, was largely based on a misapprehension, since it was believed that infestation of old pastures was cumulative and that they became more and more dangerous as the years went by. In actual fact the level of pasture infestation is governed, not by the age of the pasture, but by the rate of stocking and the level of infection in the animals grazing it. When infected cattle or horses are turned out on new grass, the number of larvae on the herbage will gradually increase for several months, until a peak level of infestation is reached when the number of old larvae dying will balance the number of fresh ones developing from the faeces. Once this peak has been reached, a further increase in the level of infestation can be achieved only by increasing the number of stock. In this way the more productive new pastures, being more heavily stocked, may soon become more dangerous than old ones which have been grazed for generations, and Maurice Hall's well known dictum, "Permanent pastures perpetuate parasites," is seen to be without foundation.

It is, however, one of the first rules of good husbandry that pastures, whether old or new, should not be grazed continuously, and it is encouraging to note that even a short rest will probably be very beneficial from the parasite point of view. Recent work tends to show that the old idea of having to rest grassland for anything up to two years to make it safe, is probably far from correct. Although it is true that a few larvae under exceptionally favourable environmental conditions may retain their vitality for a year or more, it has been shown that the initial death-rate of larvae in heavily infected pasture is very high and that a few months or even weeks will probably suffice to reduce the infestation from dangerous to negligible proportions. The larval count on a heavily grazed horse pasture may be around 2,000 larvae per lb., but if the horses are removed and the same field retested two months later, the count will probably be less than 100 per lb. This means a difference between a possible daily intake of 200,000 larvae and one of 100 or less, and although the actual intake of infective larvae may be of little significance in a resistant adult animal, in young stock it may make all the difference between poor condition and normal healthy growth, or even between life and death.

This high initial death-rate of infective larvae means that by a combination of anthelmintic treatment of adults and the use of pasture rotation, it should be possible to rear young stock with a minimum burden of parasitic worms. It has even been suggested in the case of the horse that by the use of small doses of phenothiazine which effectively sterilise the faeces of strongylid eggs combined with the use of clean pasture (preferably newly sown leys) for foaling mares it should be possible to rear foals completely free from worms. Here, however, a note of warning must be sounded. Foals reared free from infection will have developed no resistance to parasitic invasion and may succumb quite quickly to a sudden mass-infestation if exposed on heavily contaminated pasture later in life. A foal reared in the stable can be killed by an artificial infection with a number of larvae no greater than that which might be picked up in a single day on an overstocked pasture. Until more is known of the development of resistance and the susceptibility of older animals to parasite invasion, it is clearly not without risk to aim at rearing parasite-free stock. The ideal would seem to be rather to allow the young stock to pick up a light infestation sufficient to stimulate the development of a resistance, without at any time becoming pathogenic.

You have heard from Mr. Horton-Smith how chicks may be rendered resistant to coccidiosis by allowing them to acquire and with the help of sulphonamides to overcome a mild attack of the disease early in life. Unfortunately we are not in such a happy position where helminths are concerned, as immunity to these parasites is seldom absolute. An animal which has thrown off its infection either naturally or through the use of anthelmintics is not usually resistant to reinfection. There can be no doubt, however, that some measure of resistance is developed by animals progressively exposed to infection and there is now much experimental evidence to confirm this natural phenomenon. It is particularly well illustrated by an experiment carried out by Taylor at Weybridge, in which groups of worm-free lambs were put out on an infected pasture at intervals of one to two months, throughout the summer. The first group to be put out picked up infection gradually as the pasture infestation increased, and survived throughout the whole period of the experiment, while each of the subsequent lots which were exposed immediately to a heavy infestation, suffered severely from parasitic gastritis and most of the lambs in these groups died. It was clear from the detailed results of this experiment that a gradually acquired infection led to immunity while a rapidly acquired infection led to disease and death. If this were not the case, the cumulative effect of the huge numbers of parasites which would be acquired by the grazing animal even under normal conditions would undoubtedly be fatal. The mechanism of this resistance is not well understood, but it can probably be broken down in a number of ways and the aim of any system of parasitic control should be to prevent this breakdown. Nutritional factors certainly play a large part. Well nourished animals may carry great numbers of parasites without suffering any apparent ill-effects. This is particularly marked in the case of the horse where heavy infections and high egg counts are often found in adult animals without producing any noticeable loss of condition or vitality. The great danger of such animals is as a source of infection to young

stock. Two or three foaling mares passing 2,000 strongyle eggs per gramme of faeces in the spring when conditions are very favourable to larval development, will heavily contaminate clean grazing in a very short time and foals running with them will be exposed to heavy infestation before they have a chance to develop any resistance. It is possible, however, to devise a system by which this danger can be greatly reduced and which is not expensive or impractical. We have, in phenothiazine, a drug which is remarkably effective in reducing output of strongyle eggs in the faeces to negligible proportions for four to eight weeks after dosing, and we also know that a few months of exposure to sunlight and changes in temperature and humidity will be fatal to the great majority of strongyle larvae on rested pastures. By dosing mares shortly before foaling and turning them out on pastures which have been free from horses for several months, by changing the pasture, and if necessary dosing the mares again after two to three months, it should be possible to rear foals without ever exposing them to the dangers of heavy infestation.

A good deal of work has been done on the same lines, using small doses of phenothiazine, for the prevention of parasitic gastritis in sheep. The use of salt licks containing phenothiazine greatly reduces pasture infestation by inhibiting the egg production of adult parasites in the ewes, and lambs are thus protected from exposure to heavy infestation. This method has proved particularly successful in America, where it has practically eliminated the heavy losses previously suffered among lambs raised on irrigated pastures in California. In the same way a programme of parasite control based on dosing the ewes with a full dose of phenothiazine before and after lambing, and keeping them on a 1-9 salt phenothiazine mixture from May to September, has made it possible to keep sheep profitably on permanent pastures in Kentucky where lambs could seldom be raised to maturity before. Agricultural experts estimate that this programme has been worth a million dollars a year to the sheep industry of Kentucky.

Unfortunately the use of phenothiazine salt licks has not been so spectacularly successful in this country, as the salt requirements of sheep on hill pastures are not high enough to ensure the intake of adequate amounts of phenothiazine, but this difficulty no doubt will be overcome.

It will be seen that a new approach is being made to the control of nematode parasites. The emphasis is now on pasture hygiene, achieved by combining the intelligent use of anthelmintics with controlled grazing in such a way as to protect young animals from heavy infestations and at the same time to build up their resistance to parasitic disease.

The same principles may be applied to practically all helminth infections, and as better anthelmintics become available, and more knowledge of the life cycles and bionomics of the various parasites is acquired, there is every reason to hope that the tremendous losses due to parasitism in farm livestock will be greatly reduced.

Reference.—Taylor, E. L. (1934.) *J. Helminth.* **12.** 143-164.

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Control of Ecto-Parasites of Domestic Animals

By

W. DOWNING, F.R.C.V.S.

Parasitology, or even the control of the parasites of domestic animals, is a very wide subject, embracing many specialised branches, and to discuss it in all its aspects would require more time than we have at our disposal. I propose, therefore, to restrict my remarks to certain general principles, relating to the control of the ecto-parasites of domestic animals, especially farm animals, rather than to give a recitation of a list of insecticides, which may or may not be effective against each particular parasite.

During the last few years attention has been focused on what I might term the newer insecticides, such as DDT and B.H.C.; much has been published in the professional Press, in both this country and North America, recording the results of experimental research work with these two and kindred chemicals.

Two of the most outstanding characteristics of these newer insecticides are their greater efficiency over a far wider range of parasites and their pronounced residual effects.

In the past when such chemicals as sulphur, arsenic, phenols, etc., were the only insecticides available, their uses were restricted to certain definite parasites. For instance, sulphur was effective only against the acarine mites and arsenic was used against ticks, especially cattle ticks, and for providing a limited protection against "fly-strike" in sheep. Apart from these special uses, these chemicals had a relatively low efficiency against any other parasite. For this reason it was usual to incorporate two or more of these chemicals into a preparation, which was intended for multiple use or for the control of more than one parasite in one operation, such as the dipping of sheep.

Whilst, as I have mentioned previously, these newer insecticides have a much wider range of efficiency, there is still some need for discretion in their employment if they are to be used in the most efficient and economical manner, and the best results obtained from them. For instance, B.H.C. and DDT are both effective in the eradication of sheep scab in a single dipping, but whilst this effect can be obtained with a dip wash containing only 0·1 per cent. crude B.H.C., ten times this concentration of DDT, *i.e.*, 1 per cent. in the wash, is necessary to achieve the same object. DDT, on the other hand, appears to be the more efficient against dipterous parasites.

The second characteristic, which I have mentioned, is the marked residual properties of these new insecticides. In the old days of the use of sulphur, phenols, nicotine, etc., for the eradication of sheep scab, it was necessary to double dip the affected sheep at an interval of from ten to 14 days. This was due to the fact that none of these insecticides was ovicidal and the residual effect from the first dipping was not such as to ensure the death of the young larvae hatching out from the eggs subsequent to this first dipping. I have mentioned previously that with B.H.C. and DDT, the latter at ten times the concentration of the former, complete eradication of the scab has been obtained in a single dipping. We have no evidence which would suggest that these insecticides have ovicidal effects on the eggs of the scab mite and this excellent result can have been obtained only by virtue of the continued lethal effect of the residue remaining in the fleeces of the sheep. Further in our trials we have obtained from 10 to 12 weeks' protection against re-infestation under stringent experimental conditions.

My colleague, E. P. Pollard, shortly will be publishing a paper on the control of the ked (*Melophagus ovinus*), recording a similar residual efficiency of B.H.C. and DDT for the eradication and protection against re-infestation by this parasite. Craig (1947), Hughes, Pollard *et al.* (1947) have recorded the residual properties of DDT in the prevention of "fly-strike" in sheep.

I think, however, I should like to sound a warning that because these lengthy residual effects have been obtained in sheep, it must not be assumed that similar results will be obtained on all animals. Much will depend on the species of animal and the species of parasite it is wished to control. The maximum periods of protection which have been recorded with B.H.C. and DDT against such parasites as the cattle tick (*Boophilus australis*), the horn fly (*Liperosia irritans*) and the buffalo fly (*Liperosia exigua*) have been up to 21 days, with such high concentrations of DDT as 0·5 per cent. to 1 per cent., in the spraying or dipping fluids.

This may in part be due to a variation in the resistance of the parasites to the insecticides, but there is another factor of equal importance, which is the length, density and type of the coat of the host, and the relative degree of retention of the insecticide in that coat. This concentration of the insecticide in the skin covering will, in part, determine the residual efficiency, and also the type of the hair, wool, etc., will be an influencing factor in the susceptibility of the insecticide to weathering effects of climatic conditions of rain, sunlight and of mechanical removal.

Excellent as the residual effects of these newer insecticides are, there are other aspects of parasitic control, which I am afraid are often overlooked by farmers and stockowners, and perhaps by dog and cat owners to a lesser degree. I refer to the survival of the parasites off the host and to fluctuations of parasite populations on the host.

Such parasites as ticks, fleas and maggot flies spend only part of their life-histories on the host, whilst others, such as the mange mites, lice and keds are what I will term obligatory parasites. For the former special measures are essential, although the picture is complicated in that the ticks can live on alternate hosts, such as wild game, or small mammals, and the flies are carrion feeders, as well as attacking the sheep.

It is rather concerning parasites of the second class about which I wish to speak. It is surprising how little we know of the survival of many of these parasites off the host. Of the acarine mites, most attention has been paid to the scab mite, *Psoroptes comm.* var. *ovis*, probably because of the economic importance of the disease caused by these mites. Stockman, Shilston and others investigated this problem in some detail and the sum total of their findings was that none of the stages, including the egg, can survive away from the host for more than 20 days, although Stockman did succeed in keeping females alive for 31 days; none of the mites survived when replaced on the sheep and failed to reproduce the scab. In this connection Shilston found, and my own observations agree, that the longest surviving stage is the ovigerous female. If these females are removed from the host for more than ten days, and then transferred back to the host, though they may live many days they fail to lay eggs and to produce the disease. If the interval of separation is less than ten days then they are capable of egg laying and setting up the disease.

Concerning the *Sarcoptes*, Timoney (1924) found that the

Sarcoptes scabei var. *bovis* of buffaloes, survived only a maximum of seven days, under a variety of climatic conditions. Recently Bagdanov, in Russia, has reported the survival of the *Sarcoptes* of the horse in scrapings for a period of nearly two years, when these mites were kept in sealed petri dishes in the laboratory. On opening the dishes and exposing the mites to the air they died within some six days.

Craufurd-Benson (1938) observed the survival of four species of cattle lice and found that none of them could live away from the host for more than four days, nor could the eggs hatch at temperatures much below that of the body of the host. Other workers, such as Matthysse, have obtained similar results, though in some cases the maximum period of survival is put at 15 days.

Numerous authors have reported the longevity of the sheep ked off the host, and of its pupae, and within the limits of a range of temperature of 16° to 30° C. the survival period of the adult or unfed ked was found to be seven days. Graham & Taylor succeeded in keeping unfed keds alive for 24 days at 4° C. in a refrigerator, but no attempts were made to observe if these surviving keds were capable of feeding and breeding when replaced on the host.

I have mentioned the above instances of the longevity of the parasites off the host because I think that the advent of the newer insecticides, with their residual effects, goes far to solve the problem of infected premises, pastures, etc., and they should assist greatly in the control of these parasites.

There is a further problem in parasitic control, which I fear does not receive the attention it merits from the average stockowner. When a farmer buys sheep or cattle, especially in the summer, how often does he examine them to ascertain if they are free of parasites, or take appropriate measures before turning them amongst the animals on the farm? This, I think, is an important aspect of control.

Our own investigations into the life-history of the scab mite have shown that in the summer, in Great Britain, on sheep which have been heavily infested the previous winter, the disease may make a spontaneous abatement, and to the inexperienced eye, these same sheep may appear free of scab. Careful examination of the animals may reveal a few acari still surviving in certain predilection sites, living but breeding at a relatively slow rate and causing little or no inconvenience to the host.

Craufurd-Benson (1938) has demonstrated a similar fluctuation of populations of three species of cattle lice, the lice in the summer months being found in small numbers around the horns, inside the ears and on the tail. Matthysse observed similar fluctuations on cattle in New York State, U.S.A.

Graham & Taylor (1941) mention similar fluctuations in ked population and J. MacLeod and G. A. Evans have papers on this same subject in process of publication.

I can give two illustrations of this lack of foresight which might have led to serious parasitic infestations.

Some 14 years ago a farmer of my acquaintance, in the Midlands, purchased in July or August a number of sheep from the north, which appeared quite healthy. The following winter he had an outbreak of scab, the symptoms appearing first in the purchased sheep, and later spreading to some of the remainder of the flock. I am certain that when these sheep were purchased they were in the "latent" phase of scab.

Last September on our research station we bought some 50 sheep for ked experiments. At the time of purchase the average number of keds on the sheep was six. They were kept isolated, and by January the population had increased to over 400 keds per sheep. If those sheep had not been isolated the infestation would have spread to other sheep on the station and this would have involved the dipping of "in-lamb" ewes, near to lambing time or as soon as possible after lambing.

I have given the above illustrations as, personally, I feel that if livestock, especially in these days, are to be kept healthy, as much attention should be paid and as much thought and care should be given to the prevention of the introduction of parasites into a flock or herd, as is bestowed upon contagious diseases.

This fluctuation of parasite populations is also of importance in the experimental testing of insecticides for the eradication of parasites. It has been our experience over a number of years that erroneous results may be obtained if these tests are carried out during seasons of relative population inactivity, in that good results may be obtained which, when repeated at the height of population activity and multiplication, have proved less satisfactory. I think that sometimes insufficient attention is paid to this fact.

A contribution on "Fly Control" was also read by Capt. A. G. Limont.

General Discussion

Dr. E. L. Taylor said that he had listened with great interest to the very able introduction of this wide subject by the four speakers. The four very different approaches not only added to the interest but also served to show something of the scope and the complexity of the study of the control of parasitic diseases. He thought that the great diversity of living things that were included within the field of *Veterinary Parasitology* savoured somewhat of the mixed bag of the "field naturalist," it was evidence of lack of specialisation and lack of knowledge. Whereas *Veterinary Bacteriology* was in reality only a branch of *Parasitology* it was generally regarded as a different subject altogether—a separation which had come about as a result of the great advances in that special branch.

Another sign of this lack of development in parasitology was to be seen in the nomenclature of some of the diseases. "Red-worm" disease of horses was one example and "coccidiosis" another: the former was the result of infestation by various members or groups of some 30 or 40 different species of parasitic nematodes all with different life histories and with different routes of migration and different effects upon the host. It was in reality a complex of 30 or 40 diseases rolled into one. The name "coccidiosis" had to stand for a variety of diseases of the liver, kidney and various parts of the intestines of a variety of animals and birds and as a name for disease would compare with "bacillosis" or "streptococcus," which would fill the bacteriologists with horror.

Dr. Taylor next went on to say that as knowledge of parasitology develops we should doubtless get away from some of these wide generalisations. Detailed additions to knowledge of the control of parasitic diseases were to be expected but he thought that the speakers during the afternoon had shown that some of the recent discoveries might be regarded not as detailed additions but as major developments. For instance, one of the things we must now be prepared to accept was that in some instances bad hygiene was a good thing, that where eradication of parasites could not be effected it was unwise to protect the young animals too successfully from infection, as by so doing one preserved their susceptibility. This applied to coccidiosis, to parasitic gastritis and to red-worm disease, as was very clearly shown by Mr. Horton-Smith and by Miss Russell.

A second major development in parasitology concerned the management of grazing for the prevention of disease. The old teaching had always been that it was unwise to graze young animals along with old ones because the infection of the adults was thereby passed on to the young. It was now realised that an admixture of adult stock was an advantage to the young because the adults picked up from the pasture just as many larvae but only returned one-tenth of the number returned by young stock in the form of eggs in the faeces. Hence there was seen to be a balance of 10:1 on the credit side for each resistant adult animal grazing with susceptible young ones.

A third revolutionary idea in Parasitology concerned the use of an anthelmintic in small doses. One of the principles of anthelmintic medication as developed by Hall was the requirement for their use in full anthelmintic doses in order to shock the parasitic worms and eliminate them. Small doses he regarded as of no value. Phenothiazine, however, had now introduced something quite new, being relatively non-toxic it could be used in small daily amounts over a long period. Given to horses in this way it had been found that egg production by the helminths and development of larvae in the faeces could be inhibited almost completely and the pasture maintained relatively free from infection. Dr. Taylor thought that such a line of treatment might bring its own troubles during the course of time, in the development of phenothiazine-fast strains of worms, but supposed that our chemists by the production of new anthelmintics would enable us to keep one move ahead of the worms.

Mr. Downing had stressed the importance of knowledge of the lives of parasites away from the host animal exemplified by the observation that *Sarcoptes* could not live away from its host for more than seven days. Knowledge of the reactions of coccidial oocysts, or of nematode eggs and larvae to environment was of obvious importance, and where intermediate hosts were concerned a knowledge of their relationship to environment was similarly valuable. In contrast to the attention paid to this aspect of the knowledge of parasites Dr. Taylor thought it to be a relatively neglected aspect of bacteriology and that if only some of the time spent on serological and immunological studies could have been put into the investigation of what bacteria were doing while outside the host we might have had a better understanding of the epidemiology of some of the bacterial diseases.

With reference to Mr. Downing's interesting remarks about the relatively short time for which DDT remained effective on the coat of living cattle, Dr. Taylor said that observations had been made in the early days of DDT investigation at Weybridge when it had been concluded that sebaceous secretions from the skin were probably responsible for its brief action in providing a protective covering to the DDT on the hairs. He asked whether Mr. Downing would agree that that might be a probable explanation.

With reference to Mr. Downing's principle that the most advantageous time for the application of treatment for the eradication of external parasites was the season at which those parasites were at their lowest ebb, Dr. Taylor said there appeared to be one notable exception, in the matter of sheep scab. The parasite responsible for that disease exhibited a strange migratory rhythm which Mr. Downing's investigations had done much to elucidate. During the summer when its numbers were at the lowest ebb, it showed a marked tendency to retire into certain hidden sites that were relatively inaccessible to dips so that presumably the best time at which to dip sheep for the eradication of scab was during the autumn when the mites had left the ears, infraorbital fossas and such places and, incidentally, when they were much more numerous.

Referring to Mr. Limont's opening paper, Dr. Taylor said that the sheep nostril fly was of widespread occurrence in this country although the infestations as a rule, were light. He had seen the parasites in the bronchi and had heard of several observations of their occurrence there, but held the view that this was always the result of migration after the death of the host. He admitted, however, that there was some difference of opinion on that point.

As to the general control of flies in farm buildings by the use of DDT, he thought it must always be worth while but did not consider that the spraying of cow houses alone would be sufficient. An attempt had been made at Weybridge to ascertain the effect of spraying the walls and ceilings of cow sheds and had led to the conclusion that although the flies which settled on the walls were killed, there were just as many waiting outside to take their place by flying in through open doors and windows. He considered, therefore, that although the spraying of cowsheds in the autumn, when fly breeding outside had ceased, might be very effective, in order to produce a result during the fly-breeding season it would be necessary to spray a considerable proportion of the buildings. It would probably be worth while spraying manure heaps, and even the outside of some of the buildings, particularly in the vicinity of manure heaps, as the general fly population of the farm buildings as a whole must be reduced in order to lessen the nuisance in any one part.

Mr. G. C. Brander: The control of flies in stables and dairies seemed to him the sort of problem they would have to approach with a definite plan. It was obvious that if they controlled the flies inside the dairy by spraying the walls and ceilings the DDT did have some discouraging effect and in addition it did kill in the long run. If they controlled the flies on manure heaps and rubbish it was 90 per cent. towards the control of flies.

Miss Freak thanked the speakers for the clear exposition of their different branches of the subject. It had given her as a practitioner a wider appreciation of parasitology as part and parcel of the whole disease problem, rather than a separate subject where one's efforts were almost solely directed to the administration of doses to kill parasites. She was interested in the persistence of the mange parasite apart from the host. With canine *Sarcoptes* it had been said that the kennel had got to be blowlamped out after a case, otherwise *Sarcoptes* stayed indefinitely, but it seemed from Mr. Downing's remarks on other species that the leaving of the kennel vacant might accomplish the same end. She suggested that the prophylactic washing of dogs coming into suspected kennels might be a valuable procedure for boarding kennels. As to animals licking, was there any further information on the subject of the toxicity of B.H.C. to cats? They were familiar with the toxicity of DDT, but so far B.H.C. appeared fairly safe; the fact that the cat did more licking than most animals might merely mean a shorter persistence time of B.H.C. in the coat but she would like to know if there was any further information as regards toxicity. It had been said that lice and keds were active during the winter months but the reverse was her experience with fleas and lice on cats and dogs, where heavy infestation occurred in summer. Had they any information on the relative persistency of B.H.C. in smooth-coated or rough-coated dogs. The remarks on control of flies suggested the usefulness of applying DDT to carcases of dead animals if they had to be kept a day or two before disposal.

On internal parasites, she was interested in salt licks with phenothiazine as it suggested a possible means of applying doses to the domestic goat. One came up against cases where the administration was resented and owners were inexperienced in drenching methods and it was a real problem.

What measures of control were best for preventing acarine infestation in young puppies? What was the optimum time to dose the bitch, or were there other methods of hygiene that could be applied? On the question of tape worm infestation in the dog, using organic arsenic one was familiar with the idiosyncracies of the animal but one met also apparent idiosyncracy on the part of the worm where although purging was efficient and prompt no worm was passed and the subsequent passage of segments showed that it had remained unaffected by the dose. Was anything known of the optimum time of dosing and were immature worms more resistant than mature worms?

Mr. Hudson said that the idea of allowing animals to contract infection under controlled conditions was utilised in some parts of the world to produce premunity against redwater and anaplasmosis. On some farms in Africa the farmers dipped their adult cattle but not the calves. In this way the calves were exposed to infection with these diseases by ticks at a time when they were relatively resistant and were then less likely to suffer a severe infection later in life.

When eradicating ticks the problem was to deal with the interim period when ticks were scanty but still present and when, if all the cattle were dipped, some might escape infection until they had reached the age at which infection might prove fatal. By allowing ticks to breed on the calves, this interim period was indefinitely prolonged. It was now considered better, therefore, to inoculate the calves with blood from a carrier animal and to dip the entire herd. By this method the ultimate aim of eradicating the ticks was attained more rapidly.

He wondered whether it might not be better, in immunising chickens against coccidiosis, to consider the artificial infection of the birds with coccidia. It might then prove possible to eliminate coccidiosis from the ground instead of maintaining a piece infected in order to expose the chickens to infection. Similarly with other conditions in which exposure to infection and treatment were suggested as methods of rendering stock resistant to infection later in life.

He would be interested to know if any of the speakers had any experience of the use of DDT or B.H.C. in the treatment of demodectic mange.

In regard to the finding of nasal fly larvae in the lungs and windpipe of sheep, his experience agreed with that of Dr. Taylor. He believed that, when these parasites were found at such sites, they had migrated there after and not before the death of the sheep.

Dr. P. L. le Roux: Some believed that worm infestations could induce an immunity in stock and some did not. Too much importance must not be attached to this "immunity theory." It might be better to get rid of the enemies of animals.

Some time ago, phenothiazine was claimed as a specific drug against many helminths but now they were told by Dr. Taylor that the worms were beginning to develop a resistance to this anthelmintic. He used it on sheep in Northern Rhodesia but found the worms, with the exception of *Haemonchus*, very phenothiazine resistant right from the beginning. Large doses were given. He was disappointed with it himself, especially for the nodular worm, *Trichostrongylus* and *Cooperia*.

Parasites in Africa caused great losses and Africa would not have meat for export here. He thought that the "immunity" observed in Great Britain must be due to the quality of the grazing. In the spring animals lost many of their worms. In the tropics they found the same thing—the parasites passed in the droppings—when the new grass appeared.

In the case of the human hookworms, some observers did at one time believe that there might be an immunity stimulated by a light infection, but this was no longer believed to be the case. In species where the larval stages migrated through various organs of the body before establishing themselves in the intestinal tract, one would have expected the stimulation of some immunity.

He thought that they must not put too much faith in this "metazoal immunity" and while they had efficient drugs for the control of parasites they must get down to it and get rid of the parasites or they would be shorter still of beef and mutton than they were to-day.

Mr. Sleith: In Ireland they also had their parasitic problems, some of them on an even greater scale, possibly due to the moist climate. With red-worm disease of horses part of the trouble was due to the rearing of animals year after year on the same paddocks; the main lines of attack were periodic dosing, good feeding and

mixed grazing, and these seemed to hold it in check. With their cattle they had a number of cases of animals heavily infested with both liver fluke and stomach worms. The problem in such cases was, could a combined dose of phenothiazine and hexachlorethane safely be given to such animals? In practice it was difficult, without microscopic examination, to distinguish the symptoms of fascioliasis from those of parasitic gastro-enteritis, and if a combined dose could be administered, thereby attacking both infestations at the same time, one of the difficulties would be solved.

Dr. C. S. M. Hopkirk: In New Zealand it was thought some of the secondary diseases of sheep were due to parasitic invasion, but that conception had been proved wrong.

Regarding toxicity of B.H.C. and DDT, trouble was being experienced with a lameness following dipping, and as a result, Mr. Harbour, of Cooper MacDougall, Robertson had gone out to New Zealand to assist in the investigation of this condition. It was possible that some bacterial agency was present in the dip, infecting the legs of the animals passing through. It might possibly be found that dips would have to have some bactericidal material added to make them safe.

He did not think that it was as much the number of parasites on pastures as the state of the pastures which caused the mortality in sheep. Some years ago, in an acute "parasitic season," if the adult sheep were first put through the pasture followed by hoggets, very little trouble was experienced by the hoggets and, furthermore, if infested hoggets were turned back on to roughage, then they tended to pick up, and rid themselves of parasites. Their best pastures of ryegrass and white clover were luscious and quickly growing and had very little roughage in them, and the death-rate from supposed parasitism appeared to be a starvation through hoggets not being able to chew the cud because of lack of roughage.

With anthrax, the soil became infested with the bacillus and it did not require blowflies to carry the organism round. Fifty or 60 years ago, unsterilised boneflour was imported from India, and anthrax bacilli so distributed had remained in the soil, causing every now and then an outbreak of anthrax on farms where the boneflour had been used.

Professor J. McCunn: He thought that animals in good condition were less likely to suffer from parasites than those in poor condition, especially so with regard to external parasites. They would get them better much quicker if nutrition was right and they were put in condition as soon as possible. With mange in horses a simple remedy was a brush, a willing man, and plenty of soap and water. One teacupful of cod liver oil added to food daily would give good results. The body could develop immunity to almost anything, not only to bacterial disease. Good nutrition meant a lot, especially with red worm. The only studs which had continued to produce really tip-top animals were the Rosebery and Derby studs, and he believed this could be largely attributed to pasture management. If the pasture management of those studs was looked into they might learn a lot. As to fowls, he had a friend with a big battery who had trouble with laryngo-tracheitis and he tried to cure it. He put hyperchlorite in the fowls' drinking water and the result was that those fowls passed a tremendous lot of worms. The hyperchlorite was ruinous for a mechanical watering system. As regards flies, his grandfather would not let anyone sweep cobwebs down in the byres and stables. He used to say "I keep cats to catch mice and spiders to catch flies." Had they any experience with coloured lighting? A friend had tried blue lighting in a slaughterhouse and he said it made a great difference to the number of flies in the place.

Dr. J. T. Edwards: The field covered by the speakers if it was to include, as Dr. Taylor rightly stressed, the whole range of parasites, not omitting the bacterial parasites, comprised practically the whole of veterinary preventive medicine. In the control of animal diseases caused by parasites there were so many points brought out by successive speakers that it was hard to single out any point for elaboration. If he had to choose one point which was most striking it would be that of Mr. Horton-Smith in stressing the lack of meaning to be attached to what is "good and bad hygiene," in relation to control of that parasitism to our understanding of which he had recently made a striking contribution. He felt that in that respect he must lend full support to Dr. Taylor. There was so much misunderstanding as to what was good and bad hygiene in dealing with specific conditions that, to his mind, the time had come to banish the word hygiene from the language as an anachronism and dismiss it as a name given to a composite subject in the veterinary curriculum. Maurice Hall's statement that "permanent pastures perpetuate parasites" had been exposed, from the evidence given by Miss Russell, in respect of its falsity, for that evidence went to show that ley farming accentuated parasitism rather than diminished it. In the same way, according to the aphorisms emitted by Maurice Hall, the difference between the human subject and animal subject in the matter of parasitism lay, as he stressed, in that the human ate from his platter and then cleaned it but the animal, after eating, proceeded at once to defaecate on its own platter. A few years ago Dr. Stapledon, at a meeting of the "Central," showed that where opportunity was given to sheep for selective grazing as between rich and poor grasses, the sheep were very careful as to their habits and showed a degree of intelligence not always seen among humans; they proceeded to eat the rich grass and at night to desecrate the poor grasses. Other examples of the falsity of Hall's dicta could be given, based as these were on so-called "principles of hygiene," whatever that meant, but deriving mostly from a superficial acquaintance with the parasites only and without taking into account the all-important subject of animal ecology as well as the comparative psychology of the host. As Dr. Taylor had said in regard to red-worm infestation in horses, they were reaching the stage in advancing knowledge when they were beginning to appreciate that they knew hardly anything about it. The mechanisms of controlling infestations and immunity, the host-parasite relationship, the factors which disturb equilibrium so as to cause grave injury to the host, and the control of specific epidemics, demanded far closer study than they had been prepared hitherto to give to them. As Dr. Horton-Smith had rightly said, a "good" control to be applied for parasitic infestation might mean at times the actual placing of animals in a condition in which they were susceptible to a moderate or benign direct infection rather than placing them in conditions in which infection was being rigorously excluded, leaving those animals afterwards in a state in which they were liable to contract fatal infection as soon as they were accidentally contaminated.

Mr. Downing had dealt with many points which he would have liked him to develop further. What had struck him recently in Egypt was the difference in the matter of sheep scab. In Egypt psoroptic mange was not prevalent but the form commonly seen (sarcoptic) was the form affecting the hairy, facial regions only. On comparing a newer remedy, such as Gammexane, with one of the older remedies, namely a freshly prepared lime-sulphur dip, the former did not come out well. He had been well aware of the pioneer work of Stockman and of Shilston, which indicated that several factors had to be taken into account in the actual treatment—the condition of the animal, season of the year and so on, as well as the need for two successive dippings, inasmuch as the usual dips failed to destroy the eggs. On applying lime-sulphur dip freshly prepared, based upon the information from older work, it was found that all stages of the sheep sarcopt were killed except the egg stage after the first dipping, and no stages remained after a second dipping performed about ten days later. On the other hand, all stages persisted after the first application of the Gammexane. In Steward's last publication it seemed that while this drug was effective against a whole range of macro-ectoparasites, it was not wholly satisfactory against sarcoptic mange. One had to be on one's guard, therefore, when one employed any of the newer remedies to control their use with the best of the previously well-tried remedies. He agreed with Professor McCunn that condition of the animal in mange mattered a great deal.

So great was the importance of the subject of parasitology, in the more restricted present-day meaning, in a country like Egypt that there was no difficulty in erecting it to the status of a major subject in the medical as well as the veterinary curriculum, because in that country the widespread infestation of the human population with bilharziasis and ankylostomiasis readily drew public attention to the seriousness of its study—a state of affairs which happily did not exist in this country but which unfortunately made it much more difficult to attract public attention to the almost equally severe parasitic infestations of the domesticated animals, which were causing untold economic losses.

The Replies

Mr. Downing, in his reply, said that in his reference to the residual effect of the insecticides on cattle, he had overlooked the matter of skin secretions; these secretions might have the same action as in the sheep's fleece, but on the latter animal the residual effect was much longer.

As to the Australian work on the loss of DDT from the coats of cattle by licking, personally he had some doubt about it. In Queensland he had seen cattle re-infested with ticks after dipping in DDT. The larvae were observed in all parts of the animals' bodies equally, even on parts where no animal could reach with its tongue. He failed to see that licking could be the most important point, because of this even distribution of the ticks.

As to sarcoptic mange in dogs, there was no work on the survival of these mites off the host, nor did we know the details of the life-cycle of the mites. It was a possibility that there might be a latent phase of the disease, as had been observed in psoroptic scab on sheep. As to whether a dog could harbour a few mites

without showing clinical signs of the disease, that was a possibility, since the clinical intensity of the disease was not always related to the numbers of mites present on the host. Such dogs might show little evidence of the disease and be carriers.

He had no evidence of the toxicity of DDT to cats, since he had no experience of the use of this insecticide on these animals. There was the objection of the smell of B.H.C. in its use for domestic animals kept as household pets. DDT appeared slow in its action on fleas on dogs, and in his controlled experiments, seven days' residual protection and no longer had been obtained. For the control of lice and fleas on dogs and cats he preferred the use of derris. As to the use of DDT for the spraying of dead sheep against flies, he had tried it and it was quite effective.

He could not say at the moment if B.H.C. was effective in the control of demodectic mange. Work in the Argentine by Canépa and De Grama had shown that the *Demodex canis* might be found in the blood, lungs, lymph glands, etc., of the affected dogs, and it was claimed that this form of mange could be produced in puppies by the oral administration of skin scrapings containing the mites. He (the speaker) had obtained living mites in blood taken from the saphenous vein of an infected dog, and there was often a very high count of mites in the faeces, even where the owner of the dog had reported no symptoms of demodectic mange visible. There appeared to be a good deal of work to be done on the life-history of the mite before they could find a proper cure for the disease.

Mr. Sleith had asked about the dual administration of phenothiazine and hexachlorethane to cattle. They had not done any work on the combination; it was possible, but he would not like to make any suggestion yet.

Nasal fly (*Oestrus ovis*) occurred in Wales and on the Romney Marsh; usually the grubs did not cause any serious symptoms beyond a slight nasal discharge. In their sheep-fly chamber, in which Romney-Southdown sheep were penned occasionally, maggots which had migrated from the noses were observed on the ground.

In reply to Dr. Hopkirk, it was hard to say much at the moment on lameness occurring after dipping. He did not think it was probable that it would occur in this country; most cases had occurred in New Zealand where washes containing B.H.C. had been in use over a period of time. The first instance in which this type of lameness was reported was after the use of a derris suspension. Generally it lasted ten days, when the sheep recovered. There was a serious loss of condition, due to the animal being unable to move freely and feed. It was believed to be of bacterial origin, and the lack of bacteriostatic action of these dips might be a contributory cause.

As to Professor McCunn's remarks, he did not think that the poor condition of the host was the chief influence in the intensity of ecto-parasitic disease in livestock. He could guarantee to infest any sheep in any condition with scab; it was found on fat sheep. He had seen in the Argentine and in this country where cattle in first class condition developed sarcoptic and/or psoroptic mange. Good reports had been received from France in the control of sarcoptic mange in sheep.

He did not think that there was any comparison between the use of lime and sulphur and B.H.C. for the control of psoroptic scab on sheep; in his experience with psoroptic mange lime and sulphur was not so effective. In America, in the use of lime and sulphur, a two minutes' immersion was considered necessary in a wash of a temperature of 100° F., and a double dipping at 10 to 14 days' intervals, but with B.H.C. a half minute's immersion in a wash of air temperature, even where an inch of ice had been taken off the water prior to the mixing of the dip, had given a complete cure in a single dipping.

Mr. C. Horton-Smith: A method of administering controlled doses of coccidia, followed by treatment, had been considered as possibly serving the dual purposes of immunising chickens and eliminating infections from the ground. There were several complications associated with it. (1) No known drug could be relied upon to kill coccidia within the host animal although there were indications that some drugs destroyed some of the parasites when administered at concentrations that are toxic to the host. If the parasite was not killed within the host the infection continued to be passed on to the ground. (2) There were six or seven species of *Eimeria* parasitic in poultry and it was necessary to make detailed studies of their life-histories, host-parasite relations, sporulation rates and so on before one could be sure of identifying many of them. There was no evidence of cross-immunity between species and correct specific identification was therefore important. (3) Another complication was that connected with assessing controlled doses of coccidia even when the species was known. Oocyst-counts made before feeding them to chicks took no account of dead sporulated oocysts or of viable sporulated oocysts that did not hatch in the intestine. (4) Although there was little evidence of it, one must also bear in mind possible differences of virulence between strains. The position was that provided the species was known, and that the numbers of sporulated oocysts required to immunise or produce death in untreated chickens was also known, it was possible to immunise chickens by administering these numbers and treating them with an effective drug that would attack the later asexual stages of the life-history; but by this means one could not hope to eliminate infections from the ground which, by being continually picked up by chicks, maintained and strengthened their already acquired immunity to disease. Another suggestion was that of feeding controlled doses of coccidia mixed in medicated mash, but one foresaw great difficulties in distributing the oocysts evenly through the mash as well as in maintaining their viability when there; in addition, some chickens would consume more mash and, therefore, more coccidia than others.

If practicable, one should perhaps aim at killing all parasites. In the case of those like coccidia, and a host of other forms which were widely distributed over the ground as highly resistant stages, it was highly improbable that we should succeed in killing every parasite there. With our present knowledge the best way was to take advantage of the natural function of immunity induced in the host by the naturally acquired parasite and to allow immunity to develop safely by treating the host during the processes of its development.

Miss Russell: It was unlikely that goats could be induced to take enough phenothiazine in a salt lick under normal conditions. A full dose repeated every two to three months might be more effective in keeping down infection of the pasture, as the egg output was reduced to negligible proportions for some little time after a therapeutic dose of phenothiazine had been given.

The prevention of *Ascaris* infection in young puppies presented a very difficult problem. It had been definitely established experimentally that pre-natal infection could take place, and it was important to treat the bitch before mating and endeavour to keep her free throughout pregnancy by strict hygienic measures.

Every practitioner and dog owner was familiar with the tapeworm (usually *Dipylidium caninum*) which did not respond to treatment with arsenicals or arecoline, and there did not seem to be any solution to this problem. The speaker did not believe that it could be anything to do with the maturity or individual susceptibility of the worms, because so often a dog would carry one or more for months or even years, resisting all treatment, and then one would try once more and for no apparent reason get a most gratifying result. Personally she thought it might be something to do with the diet and state of the bowel at the time of dosing and considered it important to feed the dog very lightly the day before treatment.

Dr. le Roux had mentioned the failure of phenothiazine against oesophagostomes in South Africa, and this raised an interesting point. The drug was considered to be 100 per cent. efficient against the adult worm in Canada, where the parasite had been completely eradicated over large areas by dosing the ewes in winter when they were housed. As the free living stages could not survive the Canadian winter on pastures, there was no source of reinfection for the ewes and lambs when they were turned out in the spring. She understood, however, that results in Australia had not been quite so good, and it was possible that the parasite present there and in South Africa might be of a different and more resistant strain, although morphologically identical with that in Canada.

In answer to Dr. Sleith, she understood that a combination of hexachlorethane and phenothiazine had been dosed to cattle at the laboratory at Weybridge, without ill effects, and believed that it could safely be recommended.

Weekly Wisdom

"... *We are thus led to show that a medical man has two great duties—to afford relief, and to guide persons to see how wonderfully capable in its functions human nature is, if it be naturally taken; and so endeavour to prevent disease and promote happiness. The very fitness of the bodily conditions reveals that happiness is the birthright of human creatures, and ancient teaching has shown beyond question that the soul is joyful in so doing. All men long to be useful, and it is our business to guide them to succeed.* ..." From Author's Preface to Lectures on Pathology delivered at the London Hospital by Henry Gawen Sutton, 1886 (London: J. & A. Churchill).

THE VETERINARY RECORD

May 7th, 1949

PARASITOLOGY : RESEARCH AND PROPAGANDA

The increasing specialisation of the present day has greatly enhanced the need for adult education and to this end scientific " propaganda "—in the unspoiled sense of spreading the gospel—has become an essential part of the mechanism of progress. The most satisfactory way in which a modern world may become aware of additions to scientific knowledge still awaits discovery but it is clear that the simple tale of the specialist, who occasionally comes out of his laboratory for the purpose of telling it, will continue to take precedence over the published word, the broadcast and the film.

In face of the modern tendency to raise this matter of propaganda to the level of a separate science we are of the opinion that it forms an essential part of the occupation of the research worker and that it is his duty to employ whatever technical aids may become available, and for him to use the propaganda technicians themselves in order to inform his fellows of new advances and to instruct in the application of his findings to the field of veterinary operations.

The occasion of the Central Veterinary Society's discussion on " The Control of Parasites," reproduced in this issue, provides a good example of this educational function of the research worker ; important advances were then described concerning the veterinary uses of new parasiticides and an account was given of an improved understanding of the relationship between certain parasites and their hosts. The combination of those advances has not only enabled us to bring important diseases under better control, but to foresee the complete eradication of some of the most expensive parasites from the farm stock of our country. These results, of enormous economic worth, derive from the efforts of a very small number of workers and once again we are reminded of the disproportionately great economic return for meagre outlay on research into disease.

There are at last some welcome signs of increased encouragement for research into veterinary parasitology ; better equipment is being provided for existing workers and more accommodation for expansion. But material things such as these are relatively easy to acquire when compared with the difficulties of providing trained workers to carry out the researches, and it is this lack which constitutes the principal check on advancement at the present time. While post-graduate training in veterinary bacteriology has received some attention at several centres during the past few years, nothing has been done to encourage the growth of parasitology : the Diploma course in Tropical Medicine, after an uncertain start, has been allowed to fade out altogether so that no preparation is made for the extensive fields of work in tropical regions. The complete neglect during the past two decades of the training of veterinary graduates for parasitological research is particularly regrettable, and now that the benefits from veterinary enquiry in this field are apparent to all, the urgent need for recruitment becomes painfully clear. Once again we are made to think of propaganda, not only among qualified veterinarians but in veterinary schools and even in the elementary schools in order to attract workers into the vacant field and make provision for the future development that is so clearly beginning.

CLINICAL COMMUNICATION

Fractured Legs in Horses

HAMILTON KIRK, M.R.C.V.S.

London, N.W.

Upon reading recently of the complete recovery of a racehorse which had fractured a leg, I am tempted once again to make a plea to my fellow practitioners for more attempts at treatment in such cases, rather than that they should have recourse to the gun almost without a second thought.

I made a similar plea during the discussion at Southport on Henry Sumner's paper entitled "Equine Accidents in the Field of Sport," for there seems no doubt that at least a proportion of horses which sustain fractures could be saved if only the veterinary surgeon is willing to go to some amount of trouble, and the owner will bear the expense. In many instances, this is confined merely to the cost of foodstuffs, especially where premises and stable hands already are available. In any event the expense involved would be far less than that represented by a total loss—unless treatment proved unsuccessful.

Such a possibility must be accepted at the outset, but naturally it would be greatly reduced by the careful selection for treatment of only such cases as seemed likely to respond to it.

One needs to secure good radiographs taken from two or three angles, study them well, and give consideration to the situation, type and extent of the lesion ; the animal's temperament, its value and its potential use for breeding purposes. The os suffraginis is probably fractured more frequently than other bones, and often will resolve without lameness ensuing. The os coronae, on the other hand, being partly within the hoof, offers a rather doubtful prognosis. Fractures not involving a joint should do well—thus oblique or transverse fractures are good, and comminuted fractures bad, cases for treatment.

At Southport I referred to a thorough-bred mare I had just X-rayed at Minehead. She was a handsome mare and a great favourite of her owner who was willing to do anything to save her. Valued at £500, she was uninsured.

Mr. Chesney, who was the attending veterinary surgeon, readily agreed to do all he could, though he, as most other veterinary surgeons would be, was sceptical of the issue. It was two or more days after the accident when I eventually arrived to radiograph the leg. The animal had been in extreme pain, sweating, and quite unable to put the foot to the ground ; nor would the horse even permit it to be touched.

The off-hind suffraginis had been fractured longitudinally in both planes, but there was little displacement and there seemed no reason why the fragments should not unite and the bone be as strong as before. The only doubt arose from the fact that the fracture involved the fetlock joint, and the question which could not be answered with certainty was whether this would of necessity cause a permanent lameness.

However, a blacksmith and his forge were obtained and the horse was measured for an iron splint to be made of 1¼ in. by ¼ in. bar iron, and consisting of a main upright support fitted at the top with a half-hoop for encircling the cannon bone, the lower end being bent to conform to the angle assumed by sustained flexion of the fetlock joint. The upright terminated inferiorly with a tilted base having a 2 in. heel and a toe clip. (See Fig.) The clip was left open until the splint had been fitted, when it was gently hammered into apposition with the hoof.

The next proceeding was carefully to apply thick wads of cotton wool all round the leg, avoiding inequalities from overlapping. These were retained by flannel bandages extending from the hock down to, and including, the hoof. The hollow of the heel was well packed with wool. The splint was fitted, and retained by three or four Gypsona bandages fairly firmly applied.

Finally, two calico bandages, soaked in plaster of Paris, were bound tightly over the whole, and including the complete foot. The horse was now able to put its foot to the ground because its weight was no longer taken by the broken pastern but (through the splint) by the cannon bone above it.

After two or three days the mare managed to lie down and rise again without assistance, began to feed well, and seemed in good shape. The splint was not removed for two months, when she walked fairly well. I had a letter from the owner last week (that is, six months after the accident) in which the following appeared :—" Black Beauty is now able to walk fairly comfortably and our veterinary surgeon who saw her three weeks ago was very well satisfied with the progress she was making."

Fig. 1

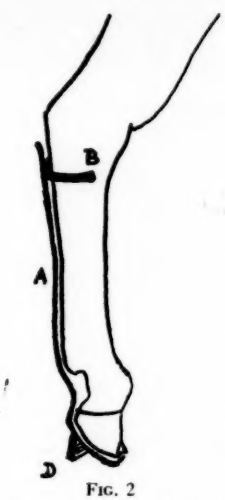

Fig. 2

Fig. 1.—Iron splint for treatment of split pastern. (*a*) Upright main support. (*b*) Loop for encircling the cannon bone. (*c*) Base for the foot to rest upon. (*d*) Two inch heel. (*e*) Toe clip.

Fig. 2.—Same splint in apposition with the horse's leg.

It is generally recognised that success does not so often follow treatment of fractures in a hind limb, and in this case we not only had a hind limb but also involvement of an articular surface. But even if in course of further time, she never trots quite sound, she can at least be bred from.

Six months before the eight-year-old racehorse "Over Land" won the two-mile March handicap steeplechase, he was *ordered to be destroyed* because of a broken leg. X-ray showed the fracture to be a serious one, but the owner determined to try to save him, although he was insured for £1,000, and sent him to a veterinary surgeon whose efforts have proved completely successful.

I know of another racehorse, at Epsom, which broke a large pastern, recovered, raced again, and then by the greatest ill-fortune, broke another leg. Almost incredibly the second fracture was also treated and the animal restored to usefulness.

Doubtless there are many other unpublished successes and it behoves us all to afford more consideration to such accidents before hastily resorting to the easy way out.

I anticipate that a good many critics will raise the objection that a horse cannot be slung for long, and although this is true, it seems to me that if a well-padded strong support is applied as high up the leg as possible, slings will be unnecessary—as in the case of Black Beauty.

SOVIET THREE-YEAR LIVESTOCK PRODUCTS PLAN

A *Reuter* message records that the Russian Government and the Communist Party have issued a joint decree setting out first steps in its new three-year plan for a big increase in livestock and the production of food and raw materials.

Higher wages, with the award of the title of "hero of Socialist labour" in outstanding cases, will be payable under the decree for increased cattle production. The order of the Red Banner will be awarded for 20 years' service in cattle breeding and the order of Lenin for 25.

All engaged in cattle breeding may retire at 50 on a 50 per cent. pension, but if they continue working they will receive full wages in addition. Every type of worker in the industry comes under the decree, from veterinary surgeons attached to breeding farms to herdsmen, calf attendants, pig and poultry specialists and attendants. Training for all workers will be improved and more schools and institutes set up for specialists.

The aim of the decree is to stop the "lagging behind" of the cattle-breeding industry and to bring this to the level of other advanced branches of agricultural production. Another is to produce more leather and wool for domestic and industrial use.

The three-year plan aims at increasing by one-half by 1951 the production of meat, fats, milk, butter, eggs, leather, wool, and other products on collective farms.

ABSTRACTS

[Field Studies of Bovine Venereal Trichomoniasis. Effects on Herds and Efficacy of Certain Practices of Control. Bartlett, D. E., & Dickmans, G. (1949.) *Amer. J. vet. Res.* **10.** 30.]

Eleven trichomonad-infected herds were observed, in nine of which measures intended to eliminate the infection were introduced. Detailed records of reproduction from two herds (65 females and two males, 50 females and three males respectively) are presented and analysed (1) while bovine venereal trichomoniasis was present, (2) after the introduction of experimental remedial measures, and (3) when the infection had been eliminated. The methods adopted for the elimination of trichomoniasis in the two herds are described, the efficacy of the control programme being evidenced by such factors as relative increases in calf crops, improved conception ratios, decreased intervals between first coitus and the initiation of successful pregnancies, and continued freedom from infection of uninfected bulls when natural breeding practices were restored.

Eight infected herds were freed from trichomoniasis: in the ninth herd the disease again was found two years after restoration of the full breeding programme. This breakdown was attributed to either a lack of co-operation resulting in inefficient execution of the prescribed instructions or to re-introduction of infection from a neighbouring herd. A hygienic breeding programme specifically designed to eliminate bovine venereal trichomoniasis is presented, by means of which the return to normal breeding practices of all females could be achieved in approximately 18 months.

C. A. E. B.

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[A New Antigenic Allergic Agent for Intradermal Brucellosis Tests. Ottosen, H. E., & Plum, N. (1949.) *Amer. J. vet. Res.* **10.** 5.]

Following earlier work by Leve and Stubbs, *Amer. J. vet. Res.* 1947, **8,** 380-385) the authors report the successful preparation of a purified, non-agglutinogenic hydrolysate of *Br. abortus* capable of eliciting a specific and well-defined cutaneous reaction on intradermal inoculation into infected guinea-pigs and cattle. A method of standardisation of this product by titration in previously sensitised guinea-pigs was evolved. It is considered desirable to run further tests in cattle before drawing definite conclusions as to the final value of this extract as a means of diagnosis of Brucellosis in cattle.

[*Abstractor's Note*: The sensitisation due to inoculation with S. 19 vaccine might prove an unsurmountable difficulty in interpretation.]

W. T. R.

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[Muscular Dystrophy in Lambs. Cotchin, E. (1948.) *Vet. J.* **104.** No. 4.]

Muscular dystrophy was diagnosed in a flock in 1947 soon after lambing had started.

A stiff gait was the most common symptom, but in some bad cases the lamb was unable to stand up or even to raise itself off the ground. Death was usually due to starvation or complications, *e.g.*, pneumonia; several lambs, however, recovered after a varying period of illness, but were checked in growth.

Ephynal (vitamin E product) was administered either orally or intramuscularly both as a curative and as a preventative. Results were conflicting and no conclusions could be drawn as to its value in the cure or control of the disease.

Seventeen affected lambs were examined *post-mortem*. All showed lesions—often bilaterally symmetrical—in the voluntary muscles, especially the muscles of the back and hind limbs; the gastrocnemius muscle almost always was affected. Fifteen of the 17 lambs showed myocardial lesions; lesions of pneumonia were seen in eight.

The lesions were often obvious to the naked eye. A clear pale yellow gelatinous fluid surrounded the affected muscle. Calcification was noted in advanced cases.

The heart usually appeared normal from the exterior; the lesions were seen as pale yellow-grey areas under the endocardium (mostly of the left ventricle).

Histological examination proved useful in doubtful cases. Degeneration with interstitial oedema was common. Signs of muscle regeneration were present even at an early stage.

S. J.

Ireland's Minister of Agriculture, Mr. James Dillon, is considering a comprehensive scheme for the development of the country's dairying industry. The scheme would make available for farmers facilities for cow testing, free veterinary services for livestock, and A.I. centres.

The XIVth International Veterinary Congress, LONDON, 1949

A MESSAGE FROM THE PRESIDENT, N.V.M.A.

There can be little doubt as to the urgent need to re-establish British prestige in the position it held in the eyes of overseas countries in pre-war years. Since opportunities are somewhat rare, each section of the community must be prepared to seize any chance that comes to hand, even if it entails considerable personal sacrifice.

An opportunity has come to the veterinary profession in this country in the holding of the XIVth International Veterinary Congress in London from August 8th to 13th. The impression of the veterinary profession in Britain which its visitors carry away will depend very largely on our showing on this occasion.

Faced with many difficulties, the Organising Committee of the " International " has had a fair level of support from Government Departments in making the arrangements which have been announced in *The Veterinary Record*. While some details of the programme are still to be filled in, an attractive week certainly is foreshadowed. It will be made all the more interesting by the decision that the N.V.M.A. Annual Congress be held during the days August 12th to 15th. Then, the Association will have a special opportunity to present the profession in Britain to our overseas colleagues. It will, however, be the aim of all members of the profession in the United Kingdom to do what they can to ensure the full success of the International Congress.

I have no hesitation in making an appeal to members of the Association to join the International Congress now and, where possible, to plan to spend all or part of the Congress period in London, ready to take an active part in the discussions and to impress on overseas visitors the vitality of British veterinary science. We must use every means to make this Congress memorable.

R. F. Montgomerie, *President*.

GENERAL INFORMATION

As will be noted from the provisional programme of papers reproduced on succeeding pages of this issue, as far as possible the leading authorities on each subject have been invited from all over the world to report on the progress made in their countries in recent years. They include contributors from : Argentine, Australia, Austria, Belgium, Canada, Chile, Czechoslovakia, Denmark, Finland, France, Germany, Great Britain, Hungary, Italy, Kenya, The Netherlands, New Zealand, Norway, Poland, South Africa, Sweden, Switzerland, U.S.A. and West Africa.

In order to assist the Organising Secretary to produce a full list of members in time for the opening of the Congress, early enrolment is requested. No special application forms are necessary, but veterinarians and scientists interested in veterinary matters, should send a cheque payable to the XIVth International Veterinary Congress, to the Organising Secretary, 10, Red Lion Square, London, W.C.1, with a covering note giving name, initials and degrees, etc., and stating the type of membership required, whether full membership, student membership or associate membership (wives and members of families).

The subscription for full members is £4, and this entitles the member to all the privileges of the Congress and to one copy of the Final Report, which will include all the papers discussed, and the discussions that took place at the Congress.

Veterinary students who have not yet qualified are entitled to student membership, subscription £1 10s., which includes many of the privileges of the Congress, but does not include the right to speak in discussions or to a copy of the Final Report. This Report can be purchased separately at a price to be notified later.

The subscription for associate members is £1, and a special programme of outings and excursions is being arranged by the Ladies' Committee for their entertainment. A copy of this programme will be handed to associate members when they register at the start of the Congress.

Any veterinarian who cannot attend, but wishes to support the Congress by becoming a member, will, of course, receive the programme and a copy of the Final Report, but if he is not able to attend he should inform the Organising Secretary when applying for membership.

Messrs. Thos. Cook & Son, Ltd., of 199, Berkeley Street, Piccadilly, W.1, are the official travel and accommodation agents for the Congress, and will undertake to reserve hotel accommodation for those who are not able to make their own arrangements. When writing to Messrs. Thos. Cook for this service, they should state that they are attending the Congress.

ANNUAL CONGRESS, N.V.M.A.

In conjunction with the " International," the Sixty-seventh Annual General Meeting and Congress of the National Veterinary Medical Association will be held in London from August 12th to 15th, 1949. Arrangements for the Congress are well in hand and the provisional programme of subjects of papers also is published in this issue.

XIVth INTERNATIONAL VETERINARY CONGRESS

Provisional Programme of Papers

PLENARY MEETINGS

Denmark ...	Prof. H. C. Bendixen	The Veterinary Profession's Contribution to the World's Meat Supply.
South Africa	Dr. P. J. du Toit ...	The Veterinary Profession's Contribution to the World's Meat Supply.
Sweden ...	Prof. N. Lagerlof ...	The Veterinarian and the Breeding and Rearing of Animals.
U.K. ...	Lord Boyd Orr ...	The World Food Situation.
U.K. ...	Dr. W. R. Wooldridge	Veterinary Education and its Application to World Problems.
U.S.A. ...	Dr. F. R. Beaudette ...	The Veterinary Profession's Contribution to the World's Poultry and Egg Supplies.

SECTIONAL MEETINGS

1. ANIMAL HEALTH AND ANIMAL PARASITES

(a) PROTOZOAL DISEASES AND THERAPEUTICS

Canada ...	Dr. W. E. Swales	The Role of Chemotherapy in the Control of Coccidiosis of Chickens.
*Czechoslovakia	Dr. F. Niznansky	Dourine—Epizootology and Diagnostics.
*France ...	Dr. Curasson	Protozoal Diseases.
Germany ...	Dr. O. Wagner	Epidemiological Researches on Piroplasmosis in Western Germany.
U.K.... ...	Dr. H. G. Lamont and Dr. W. R. Kerr	The Immune response in Trichomoniasis.
U.K.... ...	Dr. J. Carmichael	The Epizootiology of African Trypanosomiasis.
U.K.... ...	Dr. D. G. Davey	Trypanocidal Drugs.

1. **(b) HELMINTH DISEASES AND THERAPEUTICS**

Australia ...	H. McL. Gordon	Anthelmintics and the Control of Helminth Diseases of Sheep.
Denmark ...	A. Jepsen and H. Roth ...	Investigations of *Cysticercus bovis* Epizootology—Resistance of the Onchospheres.
Hungary ...	Prof. Dr. A. Kotlan ...	The developments and pathological significance of the histiotropic phase of parasitic nematodes.
New Zealand	L. K. Whitten	Photosensitized Keratitis in Calves following Drenching with Phenothiazine.
*Norway ...	Dr. G. Naerland	Nutrition in Relation to Nematode Parasitism in Sheep.
U.K.... ...	Dr. E. L. Taylor	The Epidemiology of Fascioliasis.
*U.K.... ...	Dr. C. Rayski	Studies on the Life History of Moniezia.

1. **(c) ARTHROPOD DISEASES AND THERAPEUTICS**

*Argentine ...	Dr. A. Rottgardt	*Panicum milcaceum* L. as a Photosensitizing Agent in Sheep.
*France (Persia)	Dr. Delpy	Arthropod Parasites.
Hungary ...	Prof. Dr. J. Mocsy	The Use of Contact Poisons in Veterinary Medicine.
Kenya ...	Dr. E. A. Lewis	Recent Developments in Insect and Tick-borne Diseases in East Africa.
*New Zealand	H. E. Harbour and W. S. Allan	Lameness in Sheep following Dipping in Fluids not containing Bacteriostatic substances
*U.S.A. ...	Dr. E. W. Price	Animal Health and Animal Parasites.

2. ANIMAL HEALTH AND BACTERIA

(a) BOVINE MASTITIS

*Australia ...	D. Murnane	Bovine Mastitis.
Denmark ...	A. Jepsen	Investigations of the Haemolytic Activities of the Group B Streptococcus.
*Norway ...	Dr. O. Bratlie	A study of the Pathogenesis of a Chronic Streptococcal Mastitis.
Norway ...	Director Prof. L. Slagsvold	Public Enterprises in the Control of Streptococcal Mastitis in Norway.
U.K.... ...	A. W. Stableforth	Bovine Mastitis.
*U.S.A. ...	Dr. R. B. Little	Bovine Mastitis—Recent Advances in the Transmission, Diagnosis and Bacteriology of the Disease.

2. **(b) BRUCELLOSIS**

*Argentine ...	Dr. N. D'Alessandro and Dr. D. Viroli	Experimental Brucellosis in Guinea Pigs.
*Australia ...	R. J. de C. Talbot	Brucellosis.
*Chile ...	Prof. Dr. O. B. Neira ...	*Brucella melitensis* Infection in Goats in Relation to Cheese.
*Chile ...	Dr. F. Acchairdo and A. Collin	Human Reactors to *Brucella abortus* among Slaughter-house Personnel.
Denmark ...	A. Themsen	Experimental Investigations of the Incubation of Bovine Brucellosis.
Denmark ...	H. Ottosen and N. Plum ...	Intradermal Brucellosis Tests in Cattle with a Non-antigenic Agent.
Finland ...	D. V. M. J. Holmberg ...	Contagious Abortion in Cattle.
*France ...	Dr. Lafenetre	Brucellosis.
New Zealand	M. B. Buddle	Vaccination against Bovine Brucellosis in New Zealand.
U.K.... ...	Prof. T. Dalling and J. R. Lawson	Recent Experiences in Brucellosis in Great Britain.
*U.S.A. ...	Dr. C. K. Mingle	Vaccination against Bovine Brucellosis.

2. **(c) THE CONTROL OF BOVINE TUBERCULOSIS IN VARIOUS COUNTRIES**

Australia ...	T. S. Gregory	Diagnosis and Control of Bovine Tuberculosis in the Australian Environment.
Canada ...	Dr. T. Childs ...	Eradication of Bovine Tuberculosis in Canada.
Denmark ...	F. Weldike Nielsen ...	The Organisation and Control of the Fight against Tuberculosis among Cattle in Denmark.
Finland ...	R. Stenius	Experiences in the Control of Bovine Tuberculosis in Finland.
Netherlands...	L. P. de Vries	Organisation of the Control and Eradication of Tuberculosis in Cattle in the Netherlands.
Switzerland	Prof. Dr. W. Hofmann ...	The Control of Bovine Tuberculosis in Switzerland.
U.K.... ...	J. N. Ritchie	The Importance of Eradication of Tuberculosis in Cattle from the Public Health Aspect.
U.S.A. ...	Dr. B. T. Simms	Control of Tuberculosis in Bovines.

NOTE: * = Confirmation of these papers had not been received at the time of going to press and therefore they are subject to change.

2. (*d*) OTHER ASPECTS OF TUBERCULOSIS			
*Austria	...	Prof. Dr. F. Kress	Tuberculosis Immunisation.
*Chile	...	Prof. Dr. E. Fernandez and Dr. M. Rivas	Presence of Bacillary Type of Swine Tuberculosis in Chile.
Norway	...	Director Prof. A. Brandt ...	Investigations on the Types of Bacilli in Tuberculosis in Norway.
*Netherlands	...	Dr. J. W. Thyn	Active Tuberculosis and Morphological Blood Tests.
2. (*e*) SALMONELLA			
*Australia	...	Dr. H. E. Albiston... ...	Salmonella.
Denmark	...	H. Momberg Jørgensen ...	Salmonellosis in Furred Animals.
*France	...	Prof. J. Verge	Salmonella.
Netherlands	...	Dr. Clarenburg	Salmonellosis in Cattle.
*Norway	...	Dr. O. Grini	Salmonella Diseases in Animals in Norway.
U.K.	...	A. Buxton and H. I. Field...	Salmonella in Farm Livestock.
U.S.A.	...	Dr. W. R. Hinshaw ...	Salmonellosis—A Veterinary Public Health Problem.

3. ANIMAL HEALTH AND VIRUSES

(*a*) FOOT-AND-MOUTH DISEASE VACCINATION			
Argentine	...	Dr. P. J. Schang, Dr. F. Rossi, Dr. N. Aramendi and Dr. R. Campion	Preparation of High Titre Polyvalent Foot-and-Mouth Disease Serum—Its Uses.
Denmark	...	E. Michelsen	Studies on the Antigenic Constancy of the Foot-and-Mouth Disease Virus.
*Switzerland		Dr. Moosbrugger	Recent Advances in Research on Virus of Foot-and-Mouth Disease.
Netherlands	...	Dr. H. S. Frenkel	The Cultivation of Foot-and-Mouth Disease Virus ; Vaccines Prepared with this Virus.
U.K.	...	Dr. I. A. Galloway	Observations on the Present and the Future of Foot-and-Mouth Disease Research.
3. (*b*) EQUINE INFECTIOUS ANAEMIA			
*Czechoslovakia		Dr. F. Niznansky	Equine Infectious Anaemia.
*France	...	Dr. Quentin	Equine Infectious Anaemia.
France	...	Dr. E. Lemetayer	Pernicious Anaemia of Equines.
Poland	...	Prof. Dr. S. Runge	Diagnostic Value of Ferrocyanide Potassium in Equine Infectious Anaemia.
Switzerland		Prof. Dr. W. Steck	Recent Studies on Equine Infectious Anaemia.
3. (*c*) TESCHEN DISEASE			
*Austria	...	Dr. J. Rudolf	Teschen Disease and Diagnosis.
3. (*d*) NEWCASTLE DISEASE			
Hungary	...	Dr. L. Schneider	Serum Treatment and Vaccination against Newcastle Disease.
Netherlands	...	Prof. Dr. J. Jansen and Dr. H. Kunst	Is Duck Plague Virus Related to Fowl Plague or to Newcastle Disease ?
U.K.	...	Dr. R. F. Gordon and F. D. Asplin	Newcastle Disease.
U.S.A.	...	Dr. J. R. Beach	Newcastle Disease (Avian Pneumoencephalitis) in the United States.
3. (*e*) SWINE FEVER			
*Argentine	...	Dr. S. J. J. Larroux ...	Control of Swine Fever with Crystal Violet Vaccination.
Argentine	...	Dr. P. J. Schang	Transmission and Prophylaxis of Swinepox.
Australia	...	G. Edgar, L. Hart and J. T. Hayston	Studies on the Viability of the Virus of Swine Fever.
Australia	...	M. Henry	Swine Fever.
*Austria	...	Dr. J. Michalka	Swine Fever.
*France	...	Dr. Donatien	Swine Fever.
U.K.	...	T. M. Doyle	Immunisation against Swine Fever.
*U.S.A.	...	Dr. J. D. Ray	Swine Fever (Hog Cholera).
3. (*f*) RINDERPEST			
*Australia	...	K. V. L. Kesteven	Lapinised Rinderpest Vaccine.
Canada	...	Major R. V. L. Walker ...	Avianized Rinderpest Vaccine.
*France	...	Dr. H. Jacotot	Rinderpest.
Kenya	...	Dr. H. S. Purchase ...	The Control of Rinderpest in Undeveloped Countries with Special Reference to the Far East.
U.K.	...	Dr. J. T. Edwards	The Uses and Limitations of the Caprinised Virus in the Control of Rinderpest Among British and Near Eastern Cattle.
3. (*g*) CORYZA IN POULTRY			
Australia	...	L. Hart	Fowl Coryza (*Haemophilus gallinarum* Infection).
*Netherlands	...	Prof. Dr. L. de Blieck ...	Coryza in Poultry.
3. (*h*) RABIES			
Hungary	...	Prof. Dr. E. Schwanner ...	Vaccination of Dogs as a Method of Eradication of Rabies.
3. (*i*) SWINE INFLUENZA			
Sweden	...	Prof. A. Hjarre, Dr. Nordberg and K. Bakos	Experimental Investigations on Swine Influenza.
U.K.	...	F. Blakemore	Swine Influenza.
3. (*j*) OTHER VIRUS DISEASES OF CATTLE AND HORSES			
Argentine	...	Dr. J. J. Monteverde and Dr. G. Garbers	Investigations of Epidemic of Equine Abortion in Province of Buenos Aires.
Hungary	...	Prof. Dr. R. Manninger ...	Virus Abortion in Mares.
Kenya	...	J. R. Hudson	A specific Venereal Disease of Cattle—Characterised by Epididymitis in Bulls and Vaginitis in Cows and Heifers.
*South Africa		Dr. R. A. Alexander ...	Lumpy Skin Disease. A New Epizootic Virus Disease of Bovines in the Union of S. Africa.
*U.S.A.	...	Dr. H. W. Schoening ...	Equine Encephalomyelitis.

4. PHYSIOLOGY AND ANIMAL HEALTH

(a) ANIMAL HEALTH AND NUTRITIONAL FACTORS: (i) METABOLISM; (ii) COPPER DEFICIENCIES; (iii) VITAMINS;

(a) (i) METABOLISM

Argentine	Prof. Dr. O. Eckell	Plants Poisonous to Livestock.
Austria	Dr. R. Koller	Porphyrine in Animal Health.
Netherlands	Prof. Dr. L. Seekles	Modes of Action and Occurrence of Minor Elements in the Animal Body in Relaiont to the Problem of Real and Conditional Deficiencies.
Norway	Dr. Per Slagsvold and Ingenieur Fr. Ender	Aetiological Investigations of Nutritional Diseases of Domestic Animals.
Sweden	Dr. S. Dyrendahl	Iodinated Proteins.

4. (a) (ii) COPPER DEFICIENCIES

Australia	Dr. L. B. Bull	Chronic Copper Poisoning in Grazing Sheep.
New Zealand	Dr. I. J. Cunningham	Copper Deficiency Diseases in New Zealand and the relation thereto of Dietary Molybdenum.
U.K.	S. Jamieson and Mrs. R. Allcroft	Hypocupraemic Conditions in Bovines.

4. (a) (iii) VITAMINS

Denmark	J. Moustgaard	The Influence of Some of the B Vitamins on the Metabolism and Health of Pigs.
*Finland	H. Westermarck	Changes in Vitamin and Mineral Metabolism in Horses with Pneumonia.
*France	Prof. Lesbouyries	Vitamin Deficiencies.
*Sweden	Prof. E. Akerblom	Rickets in Horses.

4. (b) ACETONAEMIA

*Sweden	Prof. B. Carlstrom	Aetiology and Pathogenesis of Puerperal Acetonaemia in Ruminants.
Sweden	Prof. S. Hoflund	The Connection Between Deficiency Diseases and Disturbances in the Microflora of the Rumen.
U.K.	A. Messervy	Clinical Aspects of Acetonaemia.
*U.S.A.	Dr. J. Sampson	Acetonaemia of Cattle.

4. (c) INFERTILITY

*Australia	Prof. R. M. C. Gunn and C. S. Sapsford	Sterility Particularly as Affecting Merino Sheep.
Denmark	Folmer Neilsen	Sterility in Cattle, Especially as a Result of Uterine Infection.
Hungary	Dr. Z. Csukas	The Influence of Vitamins A and D upon Sterility.
Netherlands	P. Sjollema	Contagious Sterility in Cattle.
Sweden	Dr. Holst	The Semen in Sterile Boars.
U.K.	S. L. Hignett	The Complex Nature of Herd Infertility.

4. (e) ENDROCRINES IN RELATION TO ANIMAL REPRODUCTION

*Belgium	G. Peeters	Physiology of the Udder.
Chile	C. Martinez	Influence of Different Levels of Thyroid Activity on the Semen of Fowls.
France	Prof. Simonnet	Endocrines and Animal Health.
*Norway	Dr. O. Garm	Endocrine Disturbances by Nymphomania and Adrenal Virilism in Cows.
U.K.	J. L. Hancock	Endocrinology and Reproduction in the Cow

5. HUSBANDRY AND ANIMAL HEALTH

(a) PLANTS AS ANIMAL FOODSTUFFS

*Austria	Prof. Dr. Schubert	Nutrition of Herbivora.
Australia	Dr. H. W. Bennetts	The Oestrogenic Effects of Subterranean Clover (*Trifolium Subterraneum*).
*South Africa	Dr. J. I. Quin	Nutrition in Relation to Animal Health in South Africa.
U.S.A.	Dr. G. H. Hart	Plants as Animal Feedstuffs.

5. (b) HUSBANDRY PROBLEMS AND PRODUCTION

France	Dr. Degois	Sheep Husbandry.
*Norway	Dr. O. Bratlie	Hygienic Problems in Connection with Machine Milking.
*South Africa	Prof. J. G. R. Bisschop	Animal Bionomic Problems in South Africa.
*U.S.A.	Dr. W. A. Hagan	Hygiene.
Kenya	Dr. W. G. Beaton	
Kenya	H. Hay-Barclay	

5. (c) GENETICS

Argentine	Cap. Vet. F. Salces	Hereditary Factors in the Argentine War Horse.
Australia	Dr. G. Finlay	Genetic Aspects of Fertility.
Finland	D.V.M. V. Rislakki	Blood Groups in Cattle.
*France	Prof. Lebard	Genetics.
*Norway	Prof. Per. Tuff and Dr. L. A. Gleditsch	*Ichtyosis congenita* in Calves—Hereditary Character.
Sweden	Dr. A. Bane	The Influence of Heredity and Environment on Sperm Production in Monozygous Bull Twins.
Sweden	Prof. K. Eriksson	Heredity Disturbances of Reproduction in Cattle.
Netherlands	Prof. Dr. M. G. van der Plank and Dr. W. D. Hirschfield	Increase in the Mean Milk Production by the Method of Judging the Animals.

5. (d) ARTIFICIAL INSEMINATION

*Belgium	M. Vandeplassche	Viability of Bull Semen in the Genital Tract of the Cow.
Canada	Dr. J. A. Henderson	Artificial Insemination.
Denmark	Edv. Sørensen	Experiences with Artificial Insemination in Denmark During Ten Years.
Italy	Prof. T. Bonadonna	The Function of the Veterinarian in the Field of Artificial Insemination.
U.K.	A. F. Holt	Artificial Insemination in Great Britain.

6. ANIMAL HEALTH AND VETERINARY SURGERY

(a) MAJOR SURGERY ON THE FARM

*Norway	Prof. H. E. Wirstad	Osteosynthesis in Veterinary Surgery.
U.K.	Prof. C. Formston	Traumatic Reticulitis—Its Diagnosis, its Relief by Operation—Prognosis.
U.K.	Prof. J. G. Wright	Caesarian Section in the Bovine.
*U.S.A	Dr. J. Farquharson	Recent Advances in Veterinary Surgery and Obstetrics.

6. (b) ANAESTHESIA

Argentine	Prof. Dr. A. Pires	Use of Anaesthetics in Veterinary Surgery.
*Czechoslovakia	Dr. F. Jurny	Anaesthesia.
Denmark	A. Moller Sorensen	Anaesthesia in Horses.
U.K.	H. B. Parry	A New Intravenous Anaesthetic for Use in the Horse.
*U.S.A.	Dr. C. F. Schlotthauer	Anaesthesia.

6. (c) ELECTRO-CARDIOGRAPHY

Australia	J. D. Steel	The Equine Electrocardiogram with Particular Reference to Certain Anaesthetic Agents.
Sweden	Dr. N. Lannek	Electrocardiographic Examinations in Dogs with Special Regard to Acute Myocardial Injuries.
Switzerland	Dr. Sporri	Changes in Equine Electroventriculogram—their Interpretation and Clinical Meaning.

7. ANIMAL HEALTH IN RELATION TO PUBLIC HEALTH

(a) CONTROL OF ANIMAL PRODUCTS INTENDED FOR HUMAN CONSUMPTION

Argentine	Dr. H. E. Cavandoli	Bovine Actinobacillosis in the Inspection of Meat.
Argentine	Dr. Poliza and Dr. Marin	*Mycobacterium tuberculosis* in Milk Products in Buenos Aires.
Belgium	L. Geurden	Botulism in Men and Animals.
*Czechoslovakia	Dr. J. Hokl	The Importance of Technology for the Control of Food of Animal Origin.
Norway	Dr. S. Hauge	Salmonella in Dehydrated Egg Products and Its Possible Public Health Significance.
U.S.A.	Brig.-Gen. J. A. McCallum	Control in the United States of Animal Products Intended for Human Consumption.

7. (b) THE CONTROL OF ANIMAL DISEASE BY QUARANTINE AND OTHER ENFORCED MEASURES

Australia	R. N. Wardle and R. J. de C. Talbot	The Importance of Quarantine Control on Importations of Animal Products.
*Poland	Prof. Dr. Parnas	Conception of the Organisation of Veterinary Science and Service in Slavonic Countries.
South Africa	M. Sterne and L. M. Wentzel	Botulism in Animals in S. Africa.
U.K.	J. O. Powley	The Control of Animal Diseases by Statutory Measures.
Sweden	Dr. I. Christenson	The Importance of Up-to-date Quarantines and Control at Import and Export of Animals and Animal Products.

8. GENERAL

(a) VETERINARY EDUCATION

*South Africa	Dr. G. de Kock	Veterinary Education Especially in Relation to Tropical and Subtropical Conditions.

(b) MISCELLANEOUS

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Proposed Subjects to be discussed at the Congress of the National Veterinary Medical Association of Great Britain and Northern Ireland to be held in conjunction with the "International."

Surgery of the Ears in the Dog.
Urolithiasis in Dogs and Cats.
Rickets and Tetany in Carnivores.
Organisation of Veterinary Clinical Practice.
Advances in Bone and Joint Surgery in Dogs.
Techniques in Small Animal Surgery.
Diseases in Household Animals Communicable to Man.
Clinical Aspects of Diseases of the Alimentary Tract of the Cat.
The Physiology of Reproduction in the Dog.
Leptospirosis.
Canine Distemper and Distemper-like Diseases in the Dog.
Intratracheal Narcosis in Small Animals.

PROTECTION OF PIT PONIES

Mr. D. Jeffrey Williams, Secretary of the Pit Ponies Protection Society, states that Mr. Robens, Parliamentary Secretary, Ministry of Fuel and Power, has told the society that he proposes to invite representatives of the animal protection societies to meet him in May to give him their views on amendments in the law relating to the use of horses and ponies in mines. Suggestions put forward by the society are at present being examined by the Ministry.

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Sixteen nations, including Britain, France, Spain, and the United States, were represented at the committee meetings of the World Medical Association held recently in Madrid. The purpose of these preliminary sessions is to establish an agenda for the general meeting of the association which will be held in London shortly.

N.V.M.A. Grassland Conference Proceedings

With a recent issue of *The Veterinary Record* we distributed to members, N.V.M.A., the proceedings of the Association's Conference on Grassland and Animal Health held at the Headquarters of the Wellcome Foundation, Euston Road, N.W.1, on October 28th and 29th, 1948, with the President, Dr. R. F. Montgomerie, in the chair.

Copies are available to non-members at **5s. 6d.** each (post free) (not 6s. 6d. as erroneously stated in that announcement) and to veterinary students at 2s. 6d. each (post free) on application to the General Secretary at 36, Gordon Square, London, W.C.1, to whom any member failing to receive his copy also should apply.

QUESTIONS IN PARLIAMENT

Traffic in Horses (Committee)

Mr. Peter Freeman (April 28th) asked the Minister of Agriculture whether he will now announce the names of the other members of the Committee he has set up to enquire into the traffic in horses.

Mr. T. Williams: Yes, Sir. I have already announced that the Earl of Rosebery will be Chairman of this Committee and I am now able to state that the other members will be my hon. Friend the Member for South Battersea (Mrs. Ganley), the hon. Member for Caernarvon Boroughs (Mr. Price-White), Lord Digby, and Professor W. M. Mitchell, Principal of the Royal (Dick) Veterinary College.

Mr. Freeman: Will my right hon. Friend impress upon these people the urgency of presenting a report as soon as possible, and can he say whether they will be able to commence their sittings right away?

Mr. Williams: That is already in the mind of the Chairman.

Mrs. Jean Mann: Will the Minister say whether there are any Scotsmen on this Committee?

Mr. Williams: The Chairman.

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Carcase Importations: Foot-and-Mouth Disease

Mr. Turton (April 28th) asked the Minister of Agriculture what precautions he is taking to secure that foot-and-mouth disease is not introduced into this country by importations of carcases of pork from the Continent.

Mr. T. Williams: I assume that the hon. Member refers to prospective imports from France. An agreement has been made with the French authorities, which applies to fresh or frozen beef and mutton as well as pork, providing that animals to be slaughtered for export shall not be drawn from the vicinity of any farm where foot-and-mouth disease is known to exist; that they shall be subject to veterinary examination before and after slaughter; that they shall not be slaughtered at the same time as other animals; and that the live animals and carcases destined for export shall be completely segregated from all others at the abattoirs. These arrangements, in the opinion of my veterinary advisers, provide a reasonable safeguard against the introduction of foot-and-mouth or other disease into this country.

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Rural Water Supplies (Scotland)

Major Ramsay (April 26th) asked the Secretary of State for Scotland how many water schemes have now been approved in Scotland and how many refused; for how many grants have already been given by his Department; and what is the total sum involved.

Mr. Woodburn: Up to date 177 schemes have been approved under the Rural Water Supplies and Sewerage Act, 1944, and so far grants amounting to £5,393,000 have been offered in respect of 99 of them. The number of applications refused is 31, most of them because they did not relate to rural localities as required by the Act.

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Sheep Stocks (Scotland)

Mr. Emrys Hughes (April 26th) asked the Secretary of State for Scotland what steps he is taking, in view of the meat shortage, to increase the number of sheep in Scotland.

Mr. Woodburn: Encouragement is given to farmers in Scotland to improve and increase their breeding sheep stocks by means of the hill sheep subsidy, by increased prices for fat sheep and for wool, by the provision of rams to crofting townships and by offering grants of half the cost of carrying out schemes for the improvement of hill sheep farms under the Hill Farming Act. Since June, 1947, after the heavy losses of the storms, the number of sheep in Scotland has increased by over 705,000.

Mr. Hughes: What steps is the Minister taking to stock the deer forests with sheep?

Mr. Woodburn: Steps have been taken during and since the war to put as many sheep in deer forests as the deer forests can carry, and that policy is being pursued steadily.

Mr. Snadden: Would not the right hon. Gentleman agree, in view of the present serious meat position, that the time is ripe for a comprehensive review of the maximum use of all our marginal, hill and deer farming lands?

Mr. Woodburn: I am quite sure that farmers in the Highlands would be very surprised to hear the hon. Gentleman ask that question, because they have been pressed for the last five years and have been doing their maximum.

Mr. MacLeod: While the increase of food production is welcomed, will the right hon. Gentleman see that it is not done at the expense of the human population in the Highlands?

Mr. Woodburn: One of the limiting factors in the Highlands is that we cannot have cattle without human beings to look after them, and we must re-populate the Highlands with human beings before we can re-populate them with cattle.

NOTES AND NEWS

Diary of Events

May 7th.—Meeting of the Biochemical Society, in the Department of Biochemistry, University Museum, Oxford, 1 p.m.

May 10th.—Scientific Meeting of the Zoological Society of London, Regent's Park, N.W., 5 p.m.

May 10th.—Annual General Meeting of the National Veterinary Benevolent and Mutual Defence Society at Manchester (Midland Hotel), 3.15 p.m.

May 11th.—Meeting of Editorial Executive Committee, 36, Gordon Square, W.C.1, 2.30 p.m.

May 12th.—Annual Meeting of the Dumfries and Galloway Division, N.V.M.A., at Castle Douglas (Douglas Arms Hotel), 2 p.m.

May 16th.—R.C.V.S. Pharmacology, etc., Examination (Revised Syllabus). Written, 10 to 12 noon, at appropriate Colleges.

May 16th.—Annual Meeting of the R.A.V.C. Golfing Society, at North Hants Golf Club, Fleet, 10 a.m.

May 17th.—Spring Meeting of the Eastern Counties Division, N.V.M.A., at Colchester (Red Lion Hotel), 2.15 p.m.

May 20th.—Special General Meeting of the South Wales Division, N.V.M.A., at Carmarthen (Dolwar Café), 2 p.m.

May 28th.—Meeting of the Society of Women Veterinary Surgeons at Bath (The Red House), 2 p.m.

June 1st.—Annual General Meeting of the Victoria Veterinary Benevolent Fund, at 10, Red Lion Square, W.C.1, 10.30 a.m.

June 1st (Wednesday).—Annual General Meeting of the Royal College of Veterinary Surgeons.

June 1st, 2nd and 3rd.—Quarterly Meetings of Council, R.C.V.S.

June 7th and 8th.—D.V.S.M. Written Examination, Royal (Dick) Veterinary College, Edinburgh.

June 10th.—Annual Dinner of the R.A.V.C. Officers' Club (Grosvenor House, W.).

June 23rd and 24th.—R.C.V.S. Membership Written Examination.

Aug. 8th to 13th.—Fourteenth International Veterinary Congress, Central Hall, Westminster, and Church House, Westminster, London, S.W.1.

Aug. 12th to 15th.—Sixty-seventh Annual General Meeting and Congress, N.V.M.A., in London.

June Meetings of N.V.M.A. Council and Committees in Edinburgh

The attention of members concerned is drawn to the following programme of meetings to be held in the Royal (Dick) Veterinary College, Edinburgh, on Wednesday, Thursday and Friday, June 22nd, 23rd and 24th, in order that they may make their arrangements in good time.

June 22nd.—Organising Committee, 2 p.m.; Home Appointments Committee, 4 p.m.

June 23rd.—Veterinary State Medical Committee, 10 a.m.; General Purposes and Finance Committee, 2 p.m.

June 24th.—Parliamentary and Public Relations Committee, 10 a.m.; **Meeting of Council,** 11.30 a.m.

June 21st to 24th.—Highland Agricultural Society's Show at Dundee.

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R.C.V.S. Council Election

All members of the Royal College of Veterinary Surgeons are reminded that voting papers for the annual election must be returned not later than Monday, May 9th.

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Conditions of Employment of Young Graduates

The Home Appointments Committee is collecting up-to-date information on the conditions of employment of young graduates in practice in this country. It will be of great advantage if members of the Association, whether principals or assistants, will provide the General Secretary, N.V.M.A. with a statement setting out the conditions of employment and the arrangements as to the remuneration of assistants in each practice of which they have personal experience.

This information should be in the General Secretary's hands not later than June 1st; it may be supplied anonymously, but then should be enclosed in an envelope marked "Confidential" together with a separate letter signed by the correspondent.

PERSONAL

Birth.—Lewis.—On April 29th, 1949, at 99, High Street, Rochester, to Sheila, wife of Derek George Lewis, M.R.C.V.S., a daughter, Wendy Denise.

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Mr. D. G. Wishart's Retirement.—The *Scottish Farmer* records that, to mark his retirement, Mr. D. G. Wishart, B.SC., M.R.C.V.S., Lockerbie, was entertained to dinner in the King's Arms Hotel, Lockerbie, on April 2nd, and was presented with a gold watch and a wallet of treasury notes from the agricultural community in Annandale. Mrs. Wishart and Miss Chalmers also received gold watches. Tribute was paid to Mr. Wishart's sterling qualities by Mr. John Woodburn, Quhytewoollen, and Mr. Andrew Taylor, Lochwoodmains. Mr. Wishart intends to reside in Ayr, and will be succeeded by Mr. D. Pearson, his assistant, and Mr. I. Findlay, Kendal.

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R.C.V.S. OBITUARY

Haywood, Charles, Millstone Lane, Leicester. Graduated N. Edinburgh, June 1st, 1891. Died April 22nd, 1949; aged 82 years. Mr. Haywood had practised in Leicester for nearly 60 years.

Mr. Charles Haywood, M.R.C.V.S., of Leicester

Charles Haywood of Leicester died on April 22nd, 1949, and with his passing goes yet another of our great experts on the horse. Haywood, by his skill and integrity, did much to enhance his profession in the public esteem, and for many years "Passed by Haywood" was a hallmark for horse men.

He was born on January 3rd, 1867, at Twycross, Leicestershire, being the son of John Haywood a tenant farmer on the estate of Earl Howe. He was a pupil to the late Mr. Hack, M.R.C.V.S., and later proceeded to the New College, Edinburgh, where he had a distinguished academic career, winning the Fitzwygram prize in 1891, the year in which he qualified M.R.C.V.S. He returned to Leicester to be assistant and later partner with his old mentor Mr. Hack of Millstone Lane. On the latter's death he took over the practice and remained at work to the end.

His greatest interest was in the horse and his greatest pleasure was riding to hounds. In his younger days he was a regular follower of the Quorn, Fernie and Atherstone. He was an expert on soundness and his opinion was recognised as being second to none, and one which could be acted upon with the utmost confidence. He also conducted an extensive agricultural practice and was V.S. to the Leicester Race Club.

Haywood was a man who worked hard and played hard, was outspoken, and always meticulous in his professional life. Like many of his contemporaries, however, on the advent of mechanical traction he began to fear that horse practice was doomed, and this in spite of his own particular line and in which he had acquired such a great reputation, going from strength to strength. It amazed me that this man as long ago as 1920 should advise his son to seek fresh fields and to enter small-animal practice.

Haywood was one who earned the respect and regard of the public and also of his professional brethren and his loss is great, for the number of those who could take his place diminishes steadily.

The interment was at Gilroes Cemetery, Leicester.

He leaves a son and daughter, the son being a Member of the Royal College.

J. McC.

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The Late Mr. Harry P. Standley, M.R.C.V.S.

In our last issue we notified, with deep regret, the death of Mr. Harry Percy Standley, of Norwich, who carried on the business founded in Orford Place by his late father. Both father and son ("Harry P. Senr." died in 1944) were not only highly esteemed practitioners, but concerned for the advancement of the profession in their area through the medium of their local veterinary society—the Eastern Counties Division, N.V.M.A.—to which they gave loyal and valued support. Harry Standley junior rendered great service to the parent body by acting as Local Secretary—and a very efficient and popular one he was—to the excellent Congress held at Norwich in 1931. Of a somewhat diffident disposition, he shouldered the task manfully and rose nobly to the occasion. He leaves a widow, with whom profound sympathy is felt for her bereavement.

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An Appreciation

I first met Harry Standley when I was fresh from college and with no experience. He impressed me then by his kindliness, and tolerance of my too frequent mistakes. I have seen this later in his dealings with others, and he always took great care never to break a young fellow's spirit. He was loth to think ill of anyone and would always give the benefit of the doubt. When later on I joined him in partnership he showed the same tolerance for another man's views, and I am proud to say we worked in mutual trust and understanding, which to the end was never broken.

As an all-round practitioner he was first class, but his greatest love was for the horse. His opinion was highly valued, and as an equine surgeon his services were much sought after by his colleagues.

A keen sportsman, he was secretary of the Norwich Staghounds, and nothing suited him better than a day's hunting. Up till a year ago he rode in local point to point meetings. He was also a keen fly fisherman and a first-class shot.

He was a great worker and would always take the biggest load upon himself. His favourite expression was "I'll get it done out of the way" which often meant he was working when other people were glad to call a halt. Had he spared himself more, his life might have been prolonged but his great courage and determination kept him at it. During a short period of enforced rest he said to me "After all our work *is* our life."

This was the spirit of a man whose death will be a great loss to the veterinary profession and the community he served.

J. McL.

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A Further Tribute

The following tribute has reached us:

The death of Mr. Harry P. Standley in tragic circumstances is a great loss to the veterinary profession, especially to his many friends within the profession.

We, as his assistants in practice, have lost both a personal friend and a kind and considerate employer.

To his staff he was at all times willing to give advice and help. He was a man well loved, and his passing is to each one of us a matter for great personal regret.

T. F. T.
J. P.
R. H. H.
R. C.
D. M. R.

The Funeral

Mr. H. P. Standley's funeral was on Saturday, April 23rd, at 2 o'clock.

A service was conducted at St. Stephen's Church, Norwich. The following veterinary surgeons attended: Messrs. J. D. McLaughlan, W. F. Loveless, C. H. Downe, A. Macdonald, G. Smith, Capt. S. E. Hill, Major W. H. Wortley, Messrs. G. C. Gregory, C. T. Murphy, F. Day, G. Nixon, J. McLintock, T. F. Tunney, J. Phillips, R. H. Hawkins, R. Carr and D. M. Roe.

Interment afterwards took place at Wymondham Cemetery.

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The Late Mr. P. J. Tunney, M.R.C.V.S.

In our last issue we had also to record, by a sad coincidence, the death, which occurred suddenly at Wincanton, Somerset, on April 24th, of Mr. Peter John Tunney, M.R.C.V.S., whose father was in partnership with Mr. Harry P. Standley who died on April 21st. For some time Mr. Tunney, who was the elder son of Mr. and Mrs. T. F. Tunney, of 5, Branksome Close, Norwich, was employed by the firm and practised in the city and county.

"J. H. J." writes of him in the *Eastern Daily Press* (April 27th): "No one who knew Peter Tunney will be able to believe that he is dead. Young men such as he are always alive; this generation needs them so badly that it cannot believe itself to be without them. He was a Norwich boy, bred in the bone of Norwich though half his heart was always in Ireland. He was a veterinary surgeon by profession and many are the farmers around Wymondham, Norwich and Diss who will remember the gift that was his. Peter Tunney will be remembered by the hundreds of Norfolk people who knew him as a man who will always be young, a man with sensitiveness to his fellows that they will not meet again."

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A Colleague's Tribute

Mr. Wm. C. Auld, M.R.C.V.S., writes:

All who had the good fortune to know Peter Tunney would learn with regret of his sudden and untimely death. Born and bred in the profession, qualified just ten years, he had spent all his professional career in general practice. It would be safe to say that he enjoyed every minute of his working life, his work was his life, and to it he brought that cool, calm efficiency—so charac-

teristic of him—which speedily earned the esteem and confidence of all his clients. Quiet and undemonstrative, he had that natural gift, so difficult to acquire, of carrying his client with him, and producing that invaluable atmosphere of adviser and friend. He was a pillar of the younger school whom the profession can ill afford to lose.

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Hugh D. Gilmore, J.P., M.R.C.V.S., Kircubbin

In a recent issue of *The Veterinary Record* the death of Hugh Gilmore, of Kircubbin, Co. Down, was recorded. To very many this meant more than the passing of a friend and colleague. Hugh Gilmore was an institution. One often hears the phrase that such and such a man will be difficult to replace but I believe that in a sense Gilmore is irreplaceable. He represented a link—unique in some respects—between the old and the new. Sixty-four years of age, he combined in a delightful way the dress of the traditional country squire with the humour of a "gamin." There was no more popular figure at veterinary gatherings. Gilmore particularly regretted the gap that the war years made in the Congresses. He was a foundation member of the North of Ireland Veterinary Medical Association, and was proud of the fact that he had never missed a single meeting or function of that Association. On principle he joined the Society of Veterinary Practitioners, but was precluded by distance from attending most of the meetings. Outside the profession Hugh Gilmore had many interests but of his recreations yachting was probably his favourite.

For some time past Gilmore had had recurrent heart attacks, but he would not let up. Two years ago in Edinburgh he had a warning, and on the excursion at Southport he had another. Though advised by his doctors to take things more easily, he refused to accept any but a full and complete life. It was his proud boast that he would never pick his cases. On the day he died he attended a poultry club meeting in the evening at Kircubbin, took part in the discussion and seconded a vote of thanks to the principal speaker. He then received a call to a calving case to which he was driven by his daughter. Whilst correcting the malpresentation he chatted cheerily to his client, who was a good friend. He was just applying the ropes preparatory to traction when he turned to his daughter who was at his elbow, spoke her name and died in her arms. It is often said that a man died as he would have chosen to do—and in Gilmore's case that was undoubtedly true—he died in harness.

As a raconteur Hugh Gilmore had no equal. His description of his journey as a youth to the "Dick" College and his life there was classical—no report could do it justice and it is one of the writer's regrets that at the time the story was told no recording apparatus was available to preserve it for posterity. Gilmore related that when he arrived at the Waverley Station, Edinburgh, with his "varnished tin trunk grained like oak!" he was unaware that there were two teaching schools there, and that it was "yon big Bobbie outside the Register House" who persuaded him to go to the "Dick" and not to "William's," "so that's how I came to spend ten years under Tam Dewer instead of 14 under Billy Williams!"

The writer was once present at a meeting of the North of Ireland Division when members received a report from a deputation which the Division had sent to the Ulster Farmers' Union. The President gave an able and factual report of the interview, and then Gilmore gave his version. He described in minute detail the journey to the meeting, the dress and deportment of his fellow members and their opposite numbers; their facial expressions and mannerisms, the sombre conference chamber—nothing escaped him. The Union members had that morning had an unsatisfactory interview with the powers that be over the price of flax and this, according to Gilmore, coloured and clouded the whole proceedings.

At the Southport Congress, the writer introduced a colleague to Gilmore and in so doing said "Mr. Gilmore is a very important individual, he is a Justice of the Peace and as you see he wears a grey bowler hat; whether he wears a grey bowler because he is a J.P., or whether he is a J.P. because he wears a grey bowler, I really cannot say, but he is in good company because His Majesty King George VI wears a grey bowler." Sticking out his chest, Gilmore promptly and proudly retorted, "Aye, but he's no' a Justice of the Peace!"

On another occasion he solemnly assured the writer "there's only one thing in this world I can't resist—and that's temptation!"

Life to-day is dreary enough and now another of those who made it worth while has been gathered in. We shall miss his cheery presence at the Congress and the Alumnus Dinner will not be quite the same. But our loss is as nothing compared to that of his "good companions"—his widow and his son and daughter; to them goes out our sympathy and gratitude.

H. W. S.-B.

Export and Slaughter of Horses

Government Committee of Enquiry

Terms of Reference

As announced by Mr. Tom Williams, Minister of Agriculture, in the House of Commons on Thursday of last week (in reply to Mr. P. Freeman), the Minister of Agriculture and Fisheries and the Secretary of State for Scotland, with the concurrence of the Secretary of State for the Home Department, the Minister of Health and the Minister of Food, have appointed a Committee to enquire into:

(1) the extent of the export trade in horses for (*a*) work and (*b*) slaughter and the considerations affecting the continuance of the trade for either purpose;

(2) the extent of the practice of slaughtering horses for food for human and animal consumption in this country; and the considerations affecting the continuance of the practice;

(3) the effect of the export and slaughter of horses on the supply of working horses in this country;

(4) the desirability or otherwise of encouraging the breeding of horses for slaughter;

(5) the statutory provisions designed to prevent unnecessary suffering by horses while being transported by air, rail, road or sea and in the slaughterhouses; whether such provisions are adequate and whether they are properly enforced;

and to make recommendations.

The Chairman of the Committee is Lord Rosebery, and the other members are: Lord Digby, D.S.O., M.C.; Mrs. C. S. Ganley, M.P.; Professor W. M. Mitchell, M.C. M.B. M.R.C.V.S., and Lt.-Col. D. A. Price White, M.P.

The Secretary of the Committee is Mr. J. E. Maher, Ministry of Agriculture and Fisheries, 14/21, Chester Terrace, London, N.W.1, to whom all communications relative to the work of the Committee should be sent.

Biographical Notes on Members

The Right Honourable the Earl of Rosebery, K.T., D.S.O., M.C.—Secretary of State for Scotland, 1945; Regional Commissioner for Scotland, 1941-45; Senior Steward of the Jockey Club, 1947-48.

Lord Digby, D.S.O., M.C.—Vice-President of the Royal Agricultural Society of England; Past-president of the Hunters' Improvement and National Light Horse Breeding Society and of the International Horse Show.

Mrs. C. S. Ganley.—Labour M.P. for South Battersea; President of the London Co-operative Society.

Professor W. M. Mitchell, M.C.—Principal of the Royal (Dick) Veterinary College, Edinburgh.

Lt.-Col. D. A. Price White.—Conservative M.P. for Carnarvon Boroughs; practising solicitor as Price White & Co., Bangor, Llandudno and Pwllheli.

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FRENCH IMPORTS AND THE RISK OF FOOT-AND-MOUTH DISEASE

Mr. H. C. Swann, M.R.C.V.S., of King's Lynn, contributes the following letter to the issue of *The Farmer and Stock-Breeder* of April 26th:—

In your report of the pig conference at Harper Adams (April 5th, p. 845) due emphasis has been laid on the resolution urging the need for spending dollars on the purchase of supplementary feeding stuffs. No reference has been made, however, to the latter part of this resolution which drew attention to the unanimous concern felt by the congress regarding the risk of introducing foot-and-mouth disease and other diseases as a result of importation of pig meat from France.

The British Government has recently made a trade agreement with France for such importations, despite the fact that France is a country where foot-and-mouth disease is often rife, and where because of its geographical position, control of this disease cannot be successfully enforced.

It woud appear that French representatives have given assurances that no meat from animals within 20 kilometres of any outbreak of the disease in France will be consigned to this country. They also assure that animals will be slaughtered in special slaughterhouses and that the meat will be stored in storage refrigerators separate from French meat.

In my opinion it may be found that such safeguards will become overwhelmed by practical difficulties, and when one considers the risk of contamination in France by slaughtering personnel, railway trucks, packing cases, etc., and the added risk of such meat being unknowingly derived from animals in the incubation stages of the disease but not showing symptoms, I view with alarm the prospects of there being serious outbreaks of foot-and-mouth disease in this country as a result of such importations.

A few days ago Dr. Edith Summerskill said in the House of Commons that 2 500 tons of pig meat is already waiting to be

exported to this country. Is this the first consignment which will fail to comply with the French assurances for disease control?

May I reiterate the opinions which I expressed at Harper Adams: that I cannot see the point in exposing the pigs and valuable dairy herds of this country to the risk of foot-and-mouth disease for the sake of a few tons of meat from France, especially when there is every chance that a serious outbreak of this disease may well result in a far greater loss of home-produced meat, and the compulsory slaughter of many of our own valuable pedigree stock.

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Irish Branch of the Ladies' Guild

The current issue of the *Irish Veterinary Journal* records the holding of a meeting in the Veterinary College convened to form an Irish Branch of the Ladies' Guild of the Victoria Veterinary Benevolent Fund. Mr. Mullaney, who presided, outlined the objects of the Fund and the necessity for forming a branch of the Ladies' Guild in Ireland. He mentioned the annual amount of money which was required for relief of necessitous persons and explained that in recent years the amount subscribed to the Fund from the country was far from sufficient to meet the needs for relief there. He felt sure that the ladies would do their best to overcome this defect and he wished them all possible success in their endeavours to assist that charitable object.

Office-bearers appointed at the meeting were: President, Mrs. J. J. O'Connor; Hon. Treasurer and Hon. Secretary, Mr. J. D. O'Connor, M.R.C.V.S.; Committee: The ladies present at the meeting, namely, Mesdames Browne, O'Connor, O'Dea, Lowndes, Mullaney, Daly and Flynn.

An Appeal

Mr. J. D. O'Connor, of the Veterinary College, adds the following appeal:—

"The inauguration of the above branch of the Ladies' Guild of the Veterinary Benevolent Fund gives the ladies connected with the profession in this country their first opportunity to help in a concerted manner this charitable purpose. It was not before its time, since other branches of the Guild have been in operation in Great Britain for some time and have collected large sums of money for the Fund. . . The money which is distributed from the Fund goes for the most part to necessitous widows and orphans of deceased members of the profession. In the past the money collected in this country for the Fund has been totally inadequate to meet the demand for relief over here, despite the efforts that the Association has made in that respect.

"As Hon. Treasurer and Secretary of the newly formed Branch in this country I appeal most earnestly to the wives and families of members of the profession here together with their friends and acquaintances to band together in different parts of the country and organise social functions or other means through which they may collect money for the Fund. The students of the Veterinary College make a point of holding a raffle each year at their Annual Dance and of organising "hops" to raise funds for the purpose and what students can do in this respect the ladies can do also I am sure.

"The Ladies' Committee which has just been appointed are determined to see that nothing will be left undone by them to augment the Fund, but they must have the assistance of other ladies if they are to reach the goal that they have set themselves. This year the Committee is concentrating on obtaining subscriptions from lady members throughout the country whom they hope to enrol in the Guild. The subscription of membership is only 5s. Later on other schemes for raising money will be adopted and will be announced to members in due course."

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COMPARATIVE PATHOLOGY CONGRESS AT LYON

A Comparative Pathology Congress will be held in France, at Lyon, from June 4th to 6th inclusive. Professor Hermann, Dean of the Faculty of Medicine at Lyon, and Professor Jung, Director of the Lyon Veterinary School, will preside. The papers to be given will come under two headings: (1) Erysipelas in Man, (2) Milk Supply to a Large Urban Centre.

Details of subscriptions, etc., may be obtained from the Editor.

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"UNFIT MEAT PASSED ON"

At the meeting of Grimbsy Town Council on March 28th, the Chairman of the Health Committee explained the circumstances under which pork which had been condemned at Grimsby Central Meat Depot as unfit for human consumption was later sent by the Ministry of Food to Scunthorpe and sold. The Council supported the protest of the Health Committee against this action and agreed to protest to the Ministry against the breach of the Council's 1940 guarantee that unsound meat would not be used for human consumption.—*Meat Trades Journal.*

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IMPROVEMENT OF HERDS AND INCREASE IN MILK PRODUCTION

M.M.B.'s Panel of Honorary Consultants

Sir Thomas Baxter, Chairman of the Milk Marketing Board, announced recently that to improve herds and increase milk production a panel of honorary consultants to the board had been formed comprising 14 scientists from six different countries all of whom had international reputations for their work on breeding, feeding, and management of cattle. The work of the panel would be co-ordinated by Mr. Joseph Edwards, scientific adviser to the board. Members of the panel were:—

Professor W. E. Petersen, Mr. M. H. Fohrman, Professor J. L. Lush, and Dr. G. W. Salisbury (United States); Mr. J. A. Henderson (Canada); Dr. H. W. Eskedal, Dr. V. Steensberg, and Dr. E. Blom (Denmark); Professor I. Johansson (Sweden); Mr. A. Ward and Dr. C. P. McMeekan (New Zealand); and Dr. John Hammond, Dr. H. Donald, and Dr. J. E. Nichols (Great Britain).

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INTERNATIONAL HORSE SHOW

Invitations to compete at the International Horse Show, which will be held at the White City Stadium from July 22nd to 29th inclusive have now been sent to the following countries: Belgium, Eire, France, Italy, Sweden, and the U.S. Forces in Germany. Schedules together with entry forms and time-tables are now available from the Secretary, at 66, Sloane Street, London, S.W.1. Members of the British Horse Society are reminded that the Horse Show Club is now open, subscription five guineas. Full particulars and application forms may be obtained from the Secretary as above.

Owing to the longer duration of the Show, there are additional classes in the pony, harness and jumping sections, and for the first time since the war the Lyons Challenge Cup for Light Trade Turnouts will be competed for.

Times of performances are as follows: mornings, preliminary judging, 9 a.m.; afternoons, 2 p.m.; evenings, 7 p.m. There will, however, be no evening performances on Saturday, July 23rd or Thursday, July 28th.

Her Royal Highness, Princess Elizabeth, Duchess of Edinburgh, has honoured the British Horse Society by the presentation of the Princess Elizabeth Cup, which will be competed for at the Show as a Ladies' International Jumping Championship. This will take place on Tuesday afternoon, July 26th and this performance together with Wednesday afternoon, July 27th and Friday afternoon, July 29th will be Gala performances, when the King George Vth Cup and the Prince of Wales Cup will be held respectively.

Seats may now be reserved at the White City Information and Booking Centre, 62a, Piccadilly, or the White City Box Office at the following prices: afternoons, 5s., 10s. 6d., 21s.; evenings, 5s., 7s. 6d., 10s. 6d., 21s.

On the three Gala afternoon performances certain 10s. 6d. and all 21s. seats will be raised to 15s. and 30s. respectively. On each afternoon performance a special block will be reserved for members of the Pony Club at 5s. each. In all cases respective afternoon tickets will admit to the morning preliminary judging.

It is hoped that it will be possible to arrange a display of horsemanship, and a parade of certain breeds of horses, and space has been reserved in the time-tables for these two items. At the time of writing, however, specific details are not yet available.—*Horse and Pony News.*

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How atomic research was being used in New Zealand to help solve agricultural problems has been described by the Minister in charge of the Department of Scientific and Industrial Research, the Hon. T. H. McCombs. He said that radio-active isotopes, most of them flown to New Zealand from the United States, were being used to an increasing extent as tracer elements, particularly in research into problems of deficiencies in plant and animal life. Radio-active cobalt was proving most helpful to the Department of Agriculture in experiments into the cause and cure of bush sickness among sheep.—*Farmer and Stock-Breeder.*

Under the auspices of the Cattle Sub-committee of the Berkshire County Committee of the Animal Health Trust, Professor A. N. Worden, M.A., M.R.C.V.S., will deliver a lecture on "Some Future Plans for the Cattle Research Station of the Animal Health Trust" in the Small Hall at Agriculture House, 121, Oxford Road, Reading, at 2.30 p.m. on Tuesday, May 17th. Mr. J. W. Salter Chalker, J.P., C.C., will preside.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents are requested to write as briefly as possible.

CONTROL OF TRYPANOSOMIASIS IN AFRICA

Sir,—How right you were when you emphasised in your editorial article of April 16th that the control of trypanosomiasis still lies in the eradication of the tsetse fly. Palliative measures there undoubtedly are in the form of various chemotherapeutic agents but the use of these alone cannot eradicate the disease from the vast areas of Africa.

The new drug antrycide is reputed to have not only a prompt curative action but also a residual effect which can maintain the blood of treated animals free of infection for as long as several months. Strangely enough it is this powerful preventive action of the drug which may make its wide and indiscriminate use, especially among native-owned herds, a definite source of danger. It is a recognised fact that cattle living in tsetse fly areas usually possess a strong resistance (or premunition) against the infection of trypanosomiasis, a resistance which has been built up by repeated sub-lethal doses of infection superimposed on a congenital calf-hood resistance. But this resistance or premunition is not permanent and in the course of time is lost should these animals cease to be exposed to infection, as for instance when moved to a tsetse-free area. Similarly, animals treated with antrycide and by its action protected from reinfection would in time lose their premunition and if subsequently exposed to infection after the protective action of the drug had worn off, would be likely to contract the disease in a severe and fatal form. This would create a situation worse than the present and cause a severe set-back to further use of the drug, especially in native-owned herds.

Undoubtedly there are vast possibilities for the use in Africa of a drug with the reputed curative and protective powers of antrycide, but the drug must not be used indiscriminately. To speak of issuing a syringe and a quantity of this drug to every native cattle owner in tsetse infested areas is sheer nonsense and shows a complete ignorance of the realities of the situation as it exists in the native territories of Africa.

The use of antrycide is particularly indicated in clean cattle travelling through a fly-belt or in cattle moved from an infected to a clean area, but in cattle grazing permanently in fly-belts the drug must be used with caution and only in cattle which can be kept constantly under its protective action. Then again it is just possible that antrycide could be put to practical advantage in the clearing of areas of tsetse fly. It could be given in combination with a drug such as gammexane which is reputed to have a lethal action, extending over several weeks, on insects feeding on treated cattle. Large herds of cattle treated by a combination of these two drugs, the one affording protection against the infection of trypanosomiasis and the other acting lethally on the tsetse fly, could be used as bait and made to graze in tsetse areas. A similar effect could no doubt be obtained by dipping cattle to which antrycide had been administered in a solution of gammexane or DDT.

The Position of Trypanosomiasis in Livestock Economy

In your editorial article you speak of trypanosomiasis as being probably the greatest single problem facing veterinarians working in territories where tsetse fly abounds. That may well be the case as far as those particular areas are concerned, but taking Africa as a whole, and in those territories where contagious bovine pleuro-pneumonia is endemic, the position of first importance must, I think, be given to this latter disease.

It is certainly the case that with our present knowledge of and facilities for suppressing the prevailing animal diseases in Africa, contagious bovine pleuro-pneumonia is now the only one that seriously threatens the success of large scale schemes of beef production in Africa and of cattle development generally. The introduction of one chronic carrier of pleuropneumonia (lunger) into a composite herd of fattening or breeding cattle could cause a severe outbreak and heavy financial loss. Rinderpest, blackquarter, anthrax, and haemorrhagic septicaemia can all be controlled effectively by vaccination, trypanosomiasis can be cured and to an extent even prevented, and all the tick-borne diseases can be dealt with by dipping—only pleuro-pneumonia remains as a menace against which there is no effective safeguard.

All veterinary research workers in parts of Africa where the disease exists should concentrate on research into the production of an efficient and easily applied vaccine against this disease. This is problem number one.

Beef for Britain

Britain is in urgent need of beef and yet the vast herds and flocks in the native reserves of Colonial Africa are not being fully developed nor are their potential resources being fully utilised to help to meet this need. This is a matter which deserves immediate consideration and herein lies a splendid opportunity for the Colonial Veterinary Service to show what a valuable part they can and should play in the development of the livestock industry of Africa. The N.V.M.A. should call together a committee of members who have had experience in the colonies and ask them to work out a practicable scheme for the large scale production in Africa of beef for export. The full development of the sheep and pig industries should also be included in their terms of reference. It is safe to predict that if only a fraction of the money already spent by the Government in trying to grow ground nuts in Tanganyika had been utilised in developing a veterinary sponsored scheme for the production of beef, mutton and pork in Colonial Africa, there would have been more to show for the money and, moreover, the foundations would have been laid for a prosperous livestock industry in the various colonies, an industry valuable alike to local inhabitants and oversea consumers. Instead of the daily addition to our rations of one teaspoonful of groundnut oil in the form of margarine, to obtain which all these vast sums have been spent, there would have been available substantial quantities of essential animal proteins and fats. It is not constipation that we in Britain are at present suffering from but lack of proper nourishment, and Government planners should realise that a nice juicy steak is more acceptable to the British working man, and would do him infinitely more good than small daily doses of a vegetable oil. It is the Colonial Veterinary Service that should be entrusted with the development of the livestock industry in the colonies, for it is they alone that know at the same time the native cattle owners, the many animal diseases of Africa, the essentials of animal breeding, feeding and management, and the proper methods of preparation of the various animal products.

Yours faithfully,

W. W. Henderson.

Arran View,
West Kilbride,
Ayrshire.
April 25th, 1949.

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THE FUTURE OF THE PROFESSION

Sir,—A number of letters extremely pertinent to the present and future status of the profession have recently appeared in your columns. You are, I think, to be congratulated on prompt publication of expression of widely differing viewpoints. The fact that these are published, even when critical of those conducting the *Record*, shows the interest taken by members in the well-being of the "National." But both interest and criticism must be informed to be effective; and on many points we are sadly lacking in information. It is years since regular reports of proceedings of Council, R.C.V.S., have been published; that appearing in your issue of March 26th was only a summary of some of the high-lights of recent months. One appreciates, of course, that during the deliberations leading to the Veterinary Surgeons Act, 1948, nothing of these could be made public; but one assumes that the Council also transacts other and routine business, and that publication of summaries of much hitherto "top-secret" is now possible. The Council, I feel, cannot reasonably complain of the profession's lack of interest in its proceedings if no steps are taken to make these known to its electors, in whose minds one senses a growing suspicion that all is not well in Council's ranks. The small attendances at the annual general meetings of the R.C.V.S. are, surely, symptomatic. On the two occasions when I have attended, there were not more than 12 members present apart from members of Council. It would have been perfectly possible to defeat any proposal of Council by whipping up 30 supporters and simply negativing acceptance of the annual report—a most dangerous and unhealthy state of affairs. One hopes, however, that under the new methods laid down in the Veterinary Surgeons Act, more active interest and participation will be possible, especially among new graduates who may be less hide-bound by tradition and isolation. Dr. McCunn (always at his deadliest when at his most seeming-simple) asks pertinently what are the prospects of these new graduates. His

questions are (as I suspect he knows well) in the main unanswerable save by time. Personally, I imagine that for a considerable period the effect of the new Schools will be rather to relieve pressure on the existing Schools than to increase the total number of graduates. In October, 1941, I ventured to sketch in your columns the sorts of conditions in which veterinary work of the future might well have to be conducted. Despite the ridicule (not unexpected considering the source of much of it!) with which my prognostications were greeted, they have already been fulfilled in almost every detail, even down to the formation of "New Towns." It is precisely to meet these new conditions that new methods of education have been found necessary; and if intelligently and devotedly applied (as I believe they will be in our schools) will produce graduates capable of carrying the profession to new fields and new heights of public usefulness.

Yours faithfully,

Chipping Norton, PAUL CROSFIELD.
Oxon.
April 21st, 1949.

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AN R.C.V.S. COUNCIL RESIGNATION

Sir,—One hopes that Mr. Steele-Bodger's letter will command the support of all members who are jealous for the status of their profession.

It is a cause for some alarm that the R.C.V.S. Council have, in recent years, been so obsessed with their abhorrence of drunkenness—an inexcusable, but none the less human, failing—that they have dealt with cases of far greater gravity, and infinitely more harmful to the profession as a whole, with a reckless and irresponsible leniency.

One wonders how many cases of conduct disgraceful in a professional respect never come to the notice of the Council, not so much because the invidious and distasteful duty of reporting one's colleagues is anathema to the individual member, but because the disciplinary action of the Council is so often so pusillanimous that the status of the profession is placed in further jeopardy.

Yours faithfully,

Lindula, N. H. MATHIESON.
Larkhall,
Lanarkshire.
April 30th, 1949.

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14th INTERNATIONAL VETERINARY CONGRESS

Sir,—I should like through the medium of your columns to bring to the notice of interested members the conditions under which German veterinarians can come to this Congress.

German nationals can visit this country only if they have friends here who are able and willing to bear the entire cost of travel both ways, and accommodation and all other expenses whilst here, as regulations at present do not permit Germans to bring any money out of the country, nor are they permitted to pay their travel expenses in their own country.

German veterinarians having friends here who are willing to undertake this commitment should secure from them a formal invitation, clearly stating that they will defray all their expenses; visas will then be issued.

Under these conditions German veterinarians will be very welcome at the Congress, and the names of any such veterinarians wishing to come under these conditions should be submitted to the Organising Secretary.

These conditions obviously will make it extremely difficult for German veterinary surgeons to come to London in August, yet it seems to me that it is of the utmost importance that we should have amongst us at this Congress leaders of the profession in Germany, particularly those who in their capacity as teachers are capable of influencing the outlook of the students.

I wonder if it would be possible to start a fund to enable at least one German representative to attend as the guest of the British veterinary profession? I should be pleased to hear suggestions from members who would support this scheme.

Yours faithfully,

"Newgate," F. B. EDWARDS.
Llanbrynmair,
Mont.
April 23rd, 1949.

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NIGHT VETERINARY SERVICES IN THE METROPOLITAN AREA

Sir,—Several of your correspondents have invited a statement from the Animal Welfare Societies with regard to night services in the Metropolitan area.

For many years the P.D.S.A. has maintained a 24-hour ambulance service based on its Sanatorium at Ilford, Essex.

In 1948 this service was augmented by the establishment of a 24-hour ambulance service operating from the P.D.S.A. premises at 31-32, Cork Street, London, W.1.

These arrangements have been widely publicised and no call within a 12 mile radius of either of the bases is ever refused in cases of accident or genuine emergency.

Thus it will be seen that the P.D.S.A. is making probably the greatest contribution to the service available to the public and their animals after normal surgery hours.

Yours faithfully,

W. P. HURST.
Administrative Superintendent.

The People's Dispensary for Sick Animals of the Poor,
14, Clifford Street,
London, W.1.
April 27th, 1949.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
Apr. 1st to 15th, 1949	7	2	17	—	—	—
Corresponding period in—						
1948	6	—	6	—	—	4
1947	4	—	34	—	1	—
1946	8	—	—	—	—	21
Jan. 1st to Apr. 15th, 1949	48	11	140	—	26	4
Corresponding period in—						
1948	35	—	155	1	21	11
1947	20	83	61	1	15	14
1946	37	20	—	4	34	192

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis Order of 1938

The number of bovine animals slaughtered under the Tuberculosis Order of 1938 during the period January 1st to March 31st, 1949, was 1,605.

Conditions Governing Acceptance of Display Advertisements in "The Veterinary Record."

1. The Association cannot be regarded as approving the subject matter of any advertisements; nor is it a function of the Association to test the validity of advertised matter other than as outlined below.

2. The Association reserves the right to refuse publication of any advertisement without disclosing reasons to the advertisers.

3. Supply of prophylactic or therapeutic agents for veterinary purposes direct to the lay public may be regarded as adequate reason for refusing publication of any or all advertisements submitted by the firm concerned.

4. The general nature of prophylactic or therapeutic agents should be stated as part of the advertisement.

5. If any specific claims are made by the advertiser in relation to any product, they should be stated, briefly, or at length, as part of the advertisement and should be in reasonable accord with claims published elsewhere or commonly associated with the product.

6. In the case of new products, any claims of an unusual or important nature should be supported by positive evidence that the product is worthy of extensive field use.

7. If adequate evidence becomes available which indicates that claims made in respect of an advertised product are ill-founded, misleading or extravagant, reasonable notice will be given to the advertiser either to terminate publication in *The Veterinary Record* or to amend the wording of any claim made therein and elsewhere to the satisfaction of the Association.

8. "Copy" for all advertisements to be submitted for acceptance well in advance of publication (Press day: Wednesday), to the Editor, *The Veterinary Record*, 36, Gordon Square, W.C.1.